FEBRUARY | 1956

products finishing

FINISHES ON METAL PRODUCTS

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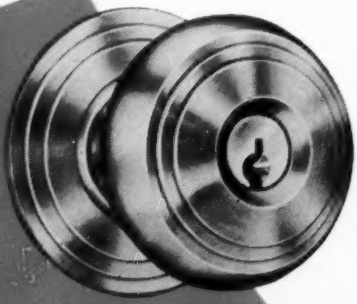
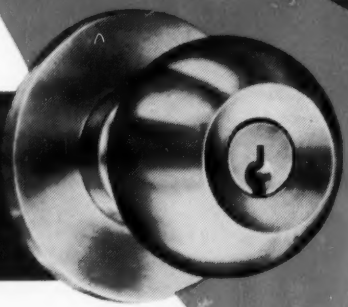
LEA

ATTRACTIVE
MODERN
DURABLE
ECONOMICAL

Satin Finish for



SCHLAGE NOVO
Satin Finished Wrou
Bronze using Lea C
pound B31.



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Satin Finished Aluminum
using Lea Compound B31.

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LUSTER-SEALED
ALUMINUM LOCKS

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139-20 109th Ave., Jamaica 35, N. Y.
Manufacturing Plant: 237 East Aurora St., Waterbury 20, Conn.

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3	16	29	42	55	68	81	94
4	17	30	43	56	69	82	95
5	18	31	44	57	70	83	96
6	19	32	45	58	71	84	97
7	20	33	46	59	72	85	98
8	21	34	47	60	73	86	99
9	22	35	48	61	74	87	100
10	23	36	49	62	75	88	101
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113	126	139	152	165	178	191	204	217	230	243
114	127	140	153	166	179	192	205	218	231	244
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116	129	142	155	168	181	194	207	220	233	246
117	130	143	156	169	182	195	208	221	234	247

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Your Monthly Source For Finishing Ideas

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109	122	135	148	161	174	187	200	213	226	239
110	123	136	149	162	175	188	201	214	227	240
111	124	137	150	163	176	189	202	215	228	241
112	125	138	151	164	177	190	203	216	229	242
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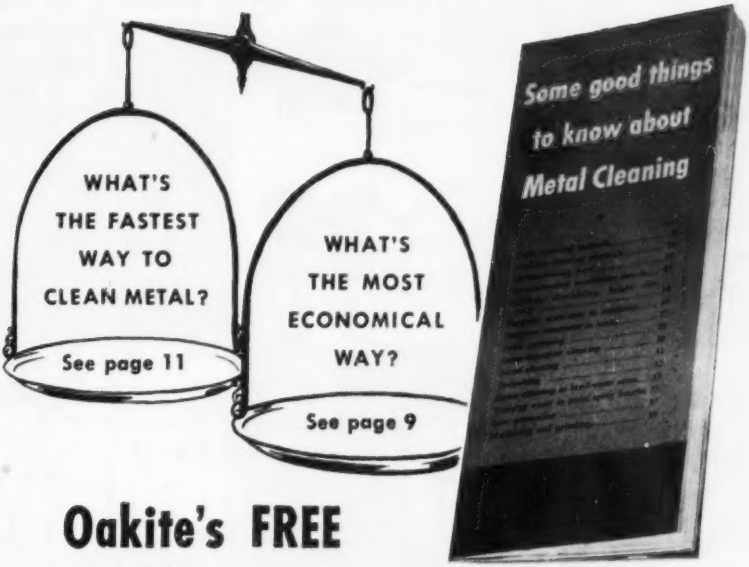
WHAT'S THE FASTEST WAY TO CLEAN METAL?
See page 11
WHAT'S THE MOST ECONOMICAL WAY?
See page 9
Some good things to know about Metal Cleaning

Oakite's FREE Booklet on Metal Cleaning

answers many questions that mean better production, more profit for you. Just look at the table of contents:

Tank cleaning methods
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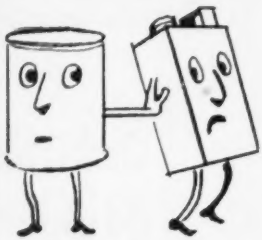
How to cut costs with *Airless* spray painting by BEDE

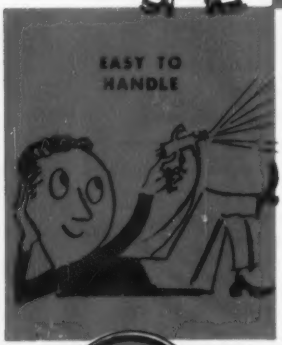


It's New and Already Used Everywhere

Airless Spray Coating is the newest development in spray painting in 50 years.

Airless Spray Painting is as much superior to common methods used today as atomization was over the brush and bucket method.

If you care about your company's coating costs, investigate Airless today. You too will be amazed at how much you can save. Write today. Be sure to ask for a demonstration.



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BEDE PRODUCTS CORPORATION

HOT SPRAY AND AIRLESS SPRAY COATING EQUIPMENT

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Current News
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UP TO 25% ON
GERMANIUM RECTIFIERS!
Now—at greatly reduced cost—electroplaters and anodizers can get the efficiency and vastly improved voltage regulation of H-VW-M Germanium Rectifiers!

It's true—*all* of H-VW-M's Germanium Rectifier models, 6 to 48 volts, have been price reduced! The reductions are up to 25%—depending on the voltage and type of voltage control. This means that you get the extra benefits of Germanium at lower prices—in a few cases at no more cost than Selenium.

Take advantage of these new low prices—and get a unit giving you an economy of operation that can't be duplicated by any other type of rectifier. You'll get 24-hour-a-day performance—with the same guarantees of trouble-free service that an H-VW-M nameplate has always represented.

As for controls . . . H-VW-M engineers will assist you in selecting the *exact* control, or control combination for your operation. H-VW-M offers the widest possible selection of controls of every type—so you can be sure their recommendation is the right one.

* Effective Feb. 1, 1956

PLATEMANSHIP

Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing—of a complete equipment, process and supply line for every need.

Write H-VW-M today for full information—or call your nearest H-VW-M representative. He's in the Yellow Pages, in the cities listed below, and their surrounding areas.

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For the newest in coated abrasives... watch BEHR-MANNING!

A favorite for dry fining and blending plumbing parts.

Tops for removing flash from difficult inside contours.

Contour polishing fluted areas of bits on 1/2" free-running belt.

Spinning-off faster, better finishes

With BEHR-MANNING Coated Abrasive Belts on the job, it's easy to bring-up superior finishes on difficult contours. For example, spin polishing hair-dryer domes (above) on smooth-cutting abrasive belts has proven a highly productive and efficient operation. Test these versatile, BEHR-MANNING Abrasive Belts on your parts — in your plant or in a nearby BEHR-MANNING Demonstration Room. Write for the Production Digest Bulletin. Contains 60 pages of detailed data on coated abrasive grinding and polishing techniques. Address Behr-Manning, Troy, N. Y., Dept. PF-2

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products finishing

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JUST CALL FOR

SEA-LAC

SEA-LAC synthetic primer surfacers air-dry in 10 minutes to handle. Bake or air-dry under a baking finish. Bake together with baking finish—in one bake. Good adhesion to steel, aluminum, fibre board, etc.

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70 years building machinery has provided us with a bank of "Know-How." Our business is to share this with you, as we have with hundreds of America's leading manufacturers.

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*POLISHING — HONING — DEBURRING

SUPERSHEEN BARRELS REDUCE FINISHING TIME 30 PERCENT ON MORE THAN 25,000 DIFFERENT PARTS

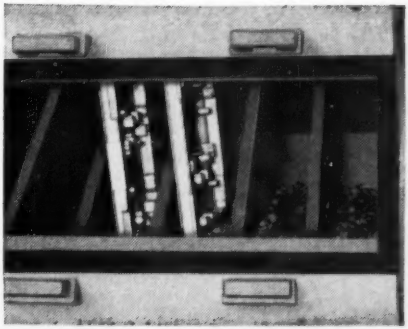
● ALMCO SUPERSHEEN Barrel Speed Finishing's versatility is demonstrated every day at the Burroughs Corporation, one of the world's largest manufacturers of business machines. Daily hundreds of thousands of parts are precision finished, many to tolerances of .002½. These parts range in size from tiny accounting machine pins to large aluminum machine base castings.

To produce the well-rounded edges and microinch surfaces so necessary to perfect operation of intricately designed business machines, the parts *must be deburred, honed and polished under rigid control.*

A prime example is the Burroughs E-101 electronic digital computer above. This desk-size "brain" includes thousands of barrel finished parts that interact almost with the speed of light. Such speed naturally demands absolutely uniform surfaces on the moving parts. Besides precision finishes, ALMCO Barrels also provide Burroughs with the flexibility of operation that's so vital in processing 25,000 different parts, including mill cut, ground, metal stamped and die cast shapes. Variable speed drive of 6 to 30 R.P.M.'s permits the exact barrel speed required for any given load of parts. Pre-set timing devices permit barrels to run unattended; when parts have been completely processed, barrels turn off automatically. This feature is of special value in finishing parts that require long time cycles.

PRODUCTION INCREASED 300% FINISHING LARGE CASTINGS

The multi-compartment type ALMCO barrel above increased Burroughs production 300% on large parts. Kept



separate to prevent impingement or peening, six large castings are deburred and honed per hour as compared to only two in the previous hand operation. Timer reverses barrel direction at pre-set intervals to assure proper abrasion on all surfaces.

For higher production demands in barrel finishing extremely large or delicate parts, fixture-type ALMCO barrels should be used — not only to increase output — but frequently unusual cost savings can be realized.

NO DOWN TIME

ALMCO engineers helped Burroughs select various size barrels for maximum versatility. Since installed in 1951 they have provided continuous service without replacement parts or down time except for occasional barrel relining.

That's because ALMCO barrels are made of heavy gauge cold rolled steel, rigidly gusseted to provide trouble-free performance and yet save money on power costs. "A" frame plus box frame construction provides extra strength. Other design features include: neoprene barrel lining; magnetic brake with toggle switch, and exclusive quick-opening and closing cam-type door.

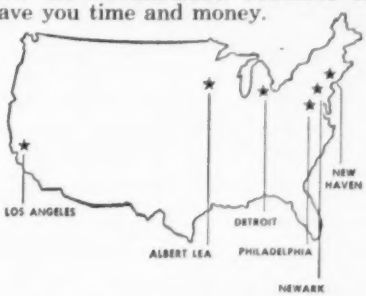
80% MORE PRODUCTION CAPACITY 20% LESS FLOOR SPACE

Burroughs' Detroit barrel finishing department is pictured above. In 1951, 24 ALMCO barrels replaced 36 constant speed, hand-fed tumbling machines. The change increased production capacity by 80%, yet required 20% less floor space. At present there

are 53 ALMCO units operating at the Detroit and Plymouth plants.

ALMCO FINISHING LABORATORIES AND ENGINEERS ONLY HOURS AWAY FROM YOUR PROBLEM

ALMCO Sales Engineers specialize only in barrel finishing equipment and supplies, giving expert service on your special problems. Branch Laboratories near most metal finishing centers as indicated on map. We invite you to come in with sample parts and observe how the SUPERSHEEN METHOD can save you time and money.



ALMCO

SUPERSHEEN METHOD FOR SPEED FINISHING

A Division of Queen Stove Works, Inc.

82 Marshall Street

ALBERT LEA, MINNESOTA

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GET BEHIND IT!!

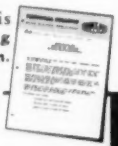
Put your metal cleaner *behind* the soil—between the soil and the metal—and you'll soon have the soil *off* the metal. That's the way you'll clean metal parts with . . .

Cowles NEW QC WASHING MACHINE CLEANER

Cowles NEW QC Washing Machine CLEANER penetrates through films of oil—crusts of drawing and stamping compounds—even into deeply recessed parts—pries the soil loose where pressure jets can't reach.

Improved penetrating, wetting, and emulsifying action in your washer without objectionable foaming.

GET THE COMPLETE STORY on this *brand NEW* Cowles QC Washing Machine Cleaner. **Send This Coupon.**



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Please send Cowles QC Bulletin

Name_____

Company_____

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Cowles CHEMICAL COMPANY

CLEVELAND 3, OHIO

See Cowles NS advertisement on page 22.

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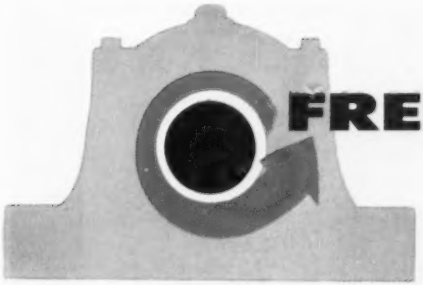


FREE RIDE . . .

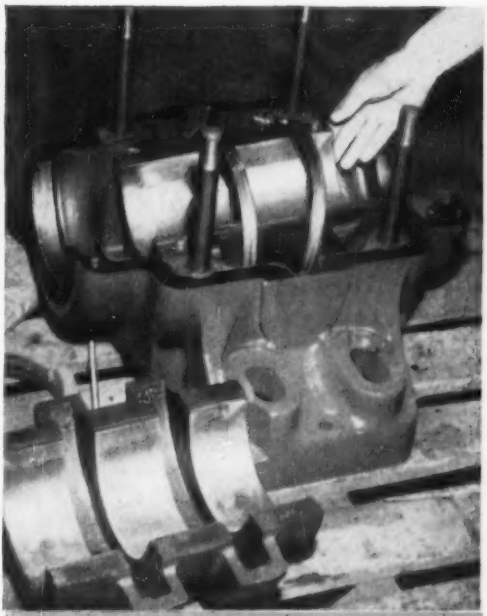
to give you the most low-voltage power for your money

Chandeysson

SELF-ALIGNING BEARINGS
ELIMINATE A MAJOR CAUSE OF FRICTION

You always know that the big, rugged shaft of a Chandeysson Motor Generator is exactly in line with its bearings. Special "self-aligning" bearings automatically compensate for normal deficiencies in foundation level or foundation shifting. Inside the pillow block, the bearing liner "rides" in a machined pocket. For added freedom from friction, patented oil rings provide plenty of lubrication along the entire journal.

Advanced ideas such as this are always incorporated in Chandeysson Motor Generators. Unified responsibility for the manufacture of every component . . . from selected raw materials to the finished product . . . is in the hands of skilled men with decades of experience in building low-voltage generators. Our aim in engineering is to *eliminate* design defects . . . rather than to correct for them. This is why more and more "Industry Leaders Choose Chandeysson!"



MAKE US PROVE to you that a Chandeysson Motor Generator set is your most economical and dependable source of low-voltage dc current. Mail this coupon today . . .

CHANDEYSSON ELECTRIC COMPANY
4082 Bingham Avenue, St. Louis 16, Mo.
Please send bulletin D-102

Name ..... Title .....

Company .....

Address .....

City ..... Zone ..... State .....

CHANDEYSSON ELECTRIC COMPANY
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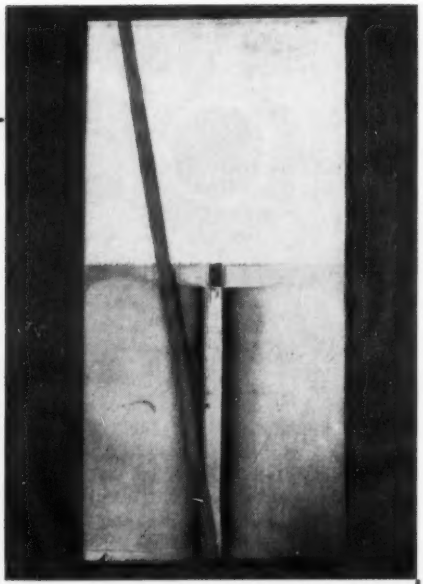
NIKOLAS

SINCE 1890

Quality Finishes

FOR THE PLATING INDUSTRY



Actual Unretouched Photo

QUALITY THAT SPEAKS FOR ITSELF—The upper half of the above silver plate was finished with Nikolas 2105 Clear Lacquer; the lower half with competitive recommended clear silver lacquer. A rubber band was placed over the two finishes and in two weeks the free sulfur had penetrated the competitive material with the above results.

The same results can be expected when testing No. 2105 Clear Lacquer for Hardness, Mar-resistance and Discoloration from direct sunlight.

The finest plated goods are protected by Nikolas Clear Finishes.

Eye Appeal Sells Your Product!

Why jeopardize your reputation with inferior finishes when the finest cost no more?

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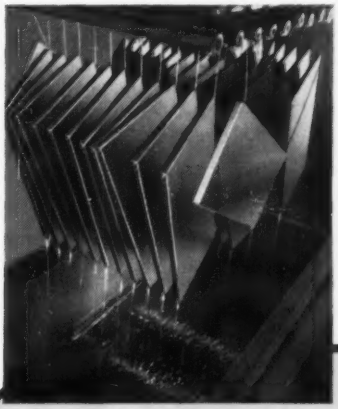
Use it COLD on all metals



in a drum...

in a tank...

or in your regular vapor degreasing machine.
No Special Equipment Needed!

KLEARALL 95

COLD DEGREASING SOLVENT

NOW . . . degrease light oils from metal parts without vapor . . . without heat . . . without rinsing . . . with KLEARALL 95. Profit by these KLEARALL 95 advantages:

- **Permits degreasing at any location or at one centralized point.**
- **Avoids production-line bottlenecks, even in coldest weather.**
- **Is non-explosive; won't support combustion in itself.**
- **Low tank evaporation.**
- **Evaporates speedily from finished work.**
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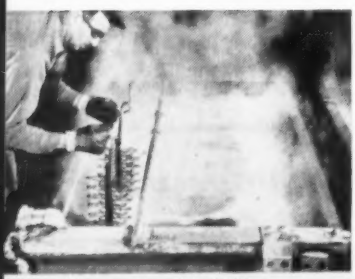

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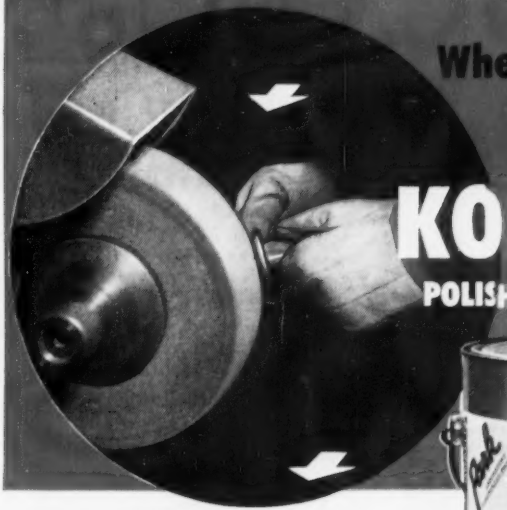

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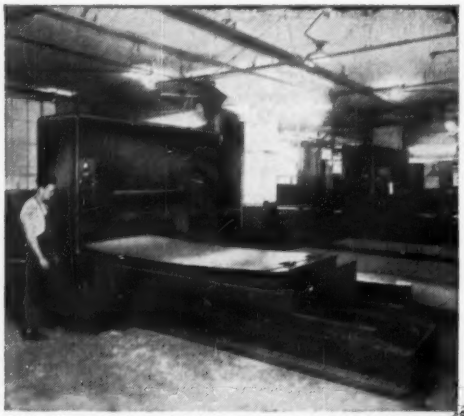

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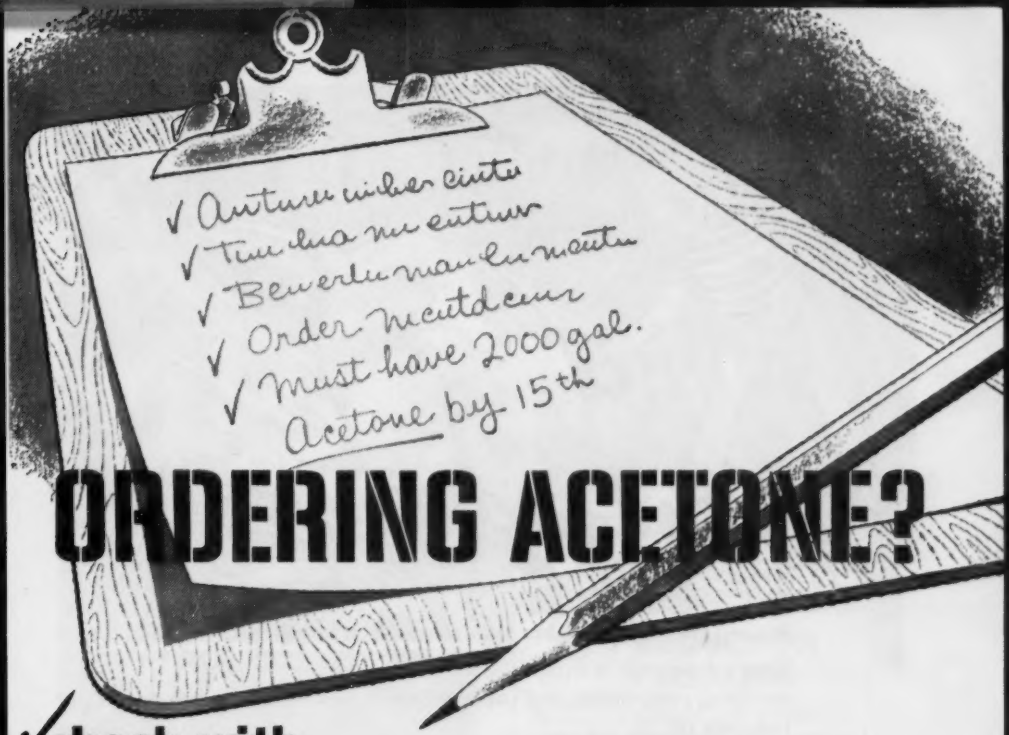

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See Cowles QC advertisement on page 10.

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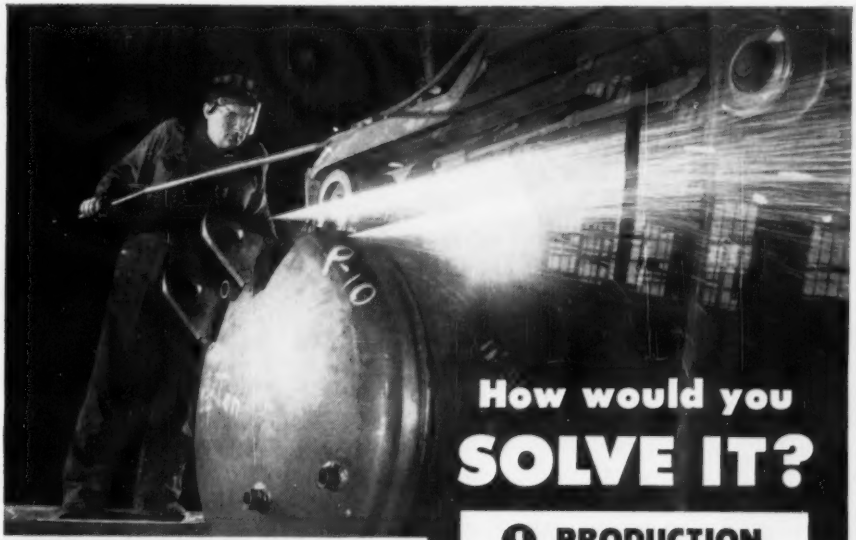

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❷ SOLUTION: A 3M Representative suggested this Saginaw, Michigan manufacturer switch to the 3M Method using Three-M-ite Resin Bond belts installed on a swing grinder. Manufacturer found that each 3M belt removed these extra-heavy-duty welds faster, better.

❸ RESULTS: An immediate production increase with much higher quality finishes. (Note: manufacturer experimented with a "Brand X" belt, found it averaged only 3 feet of weld per belt . . . 3M belt removed 30 feet!) A 3M Representative can help you solve your grinding and finishing problems, too. Call him today.

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This is not the familiar argument that white brass alloys are destined to replace nickel in the chrome process. It *is* a statement of fact about how leading platers have solved the problem of metal shortages and have saved money in so doing.

Promat Probrite is not a nickel substitute—it is a *superior* white brass alloy. It is electro-deposited to a thickness of .0002" to .00025", chrome plated, and sealed with a Promat chromate sealer to produce a protective surface with a luster comparable to that produced from a conventional bright chrome process. Probrite CR-723 is the buffable grade of the white alloy and when buffed will also have the depth of color found in the conventional decorative chrome process . . . with a cost advantage. Properly specified and properly used it will withstand standard salt spray requirements where specified for interior parts requiring high luster and long service life.

Many years of use, hundreds of hours of proven performance, and an impressive list of satisfied customers still haven't proven Probrite to be a miracle product, but they *have* proven that you can waste a lot of time and profit—*waiting* for a miracle.

PROMAT *Division*

Poor & Company

851 S. Market Street
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Vol. 20, No. 5

FEBRUARY, 1956

• • • • editorial • • • •

Available - - - - Helpful Finishing Information!

A wealth of valuable technical and practical information and data is available — free for the asking — from the many manufacturers whose equipment, materials, and processes are used each day in the Finishing Industry. Examples of the many catalogs, bulletins, and technical data sheets currently being supplied are announced in many advertisements and in the Product Literature section (pages 155 to 157, this issue) of each issue of PRODUCTS FINISHING.

It is common practice for manufacturers to issue explanatory bulletins and data sheets describing the operation of, or the superior properties and characteristics of their products. However, literature supplied by many companies goes far beyond the usual instruction sheet and approaches the textbook level, in that it discusses the subject in general terms. Thus the Finisher, whether he uses one company's products, or those of a competitor, obtains helpful suggstions which can aid him in his daily job.

The Finishing Industry is complex in that it involves so many kinds of finishes and methods of application. Descriptive literature, prepared and distributed by the finish and equipment suppliers, represents a tremendous educational effort. These companies are serving their self-interest to some degree. However, in providing educational material for the Finishing Industry, they are making a distinct contribution to industry progress. The writer has previously called attention to and acknowledged the value of this contribution.* It is in order to emphasize again the actual and potential benefit of this effort to the people in the industry.

Manufacturers would do well to advertise such technical and practical literature as they have available, to direct the attention of the Finishing Executive to it. Some companies have done this by issuing special bulletins summarizing all their other literature, and outlining the contents of the various brochures. The response to these announcements has been impressive.

The Finisher should remind himself that all this wealth of helpful information — like a clock — isn't any good unless first he gets it, and then looks at it.

So, Mr. Finisher, don't let valuable data gather dust on your office or laboratory shelves — apply the new methods in your plant. You may be surprised at the improvements that you can make!

Ezra A. Blount

—EDITOR

* *Ezra A. Blount, "Methods of Conducting Classes for Electroplaters," Proc. Am. Electroplaters' Soc.* **42**, 107-112 (1955).

New Markets and Techniques for Precious Metal Electroplates

By ALFRED M. WEISBERG
Technic, Inc.

TRADITIONALLY, PRECIOUS METAL ELECTROPLATES have been used on costume jewelry, watch bands, buckles and other articles of adornment. Adequate methods and techniques have been worked out for the brilliant five millionths of an inch thick gold, gold alloy and rhodium electroplates necessary. Today, two new and totally different markets for precious metals are present in the electronic and industrial decorative industries. These require new electroplating systems and methods.

The electrical and electronics industries have found many uses for the functional physical properties of electroplated gold, gold alloys, rhodium, platinum and palladium. Gold is most frequently used in thicknesses of 0.00002 to 0.0005 inch for its very low electrical resistance, ductility and good overall resistance to corrosion and electromigration. Heavy gold deposits are used on contacts and connectors that require high reliability even after long periods of storage, low speed moving

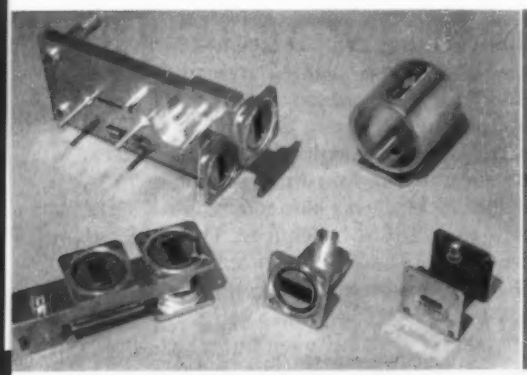

Fig. 1—These gold and rhodium plated wave guides and microwave components are resistant to tarnishing, thus give long service.

Fig. 2—Rhodium plated printed circuit switches and commutators have hardness, wear resistance necessary for this service.

contacts, wave guides and microwave plumbing for transmission of microwave frequencies and vibrating or flexing components (Fig. 1). Gold is also used to give an easily solderable surface and a low noise contact on such components as terminals, lugs and potentiometer parts.

Alloying metals are often added to gold electroplates to increase the hardness of gold (up to 150 D.P.H.) and to reduce the galling or fretting corrosion tendencies. As little as 2 per cent of certain metals will double the hardness of gold. Various gold alloys are used for special purpose connectors, rotary switches and other moving components. Alloy gold electroplates can now be tailor-made to fit a wide range of physical properties. For example, in the transistor industry a gold alloy permits a solderless n-type contact with germanium wafers.

In the electronics field, rhodium finds ever increasing uses because of its extreme hardness (in the range of hard chromium) and wear resistance. It is completely free from tarnish and is exceptionally resistant to corrosion. Of utmost importance is the stability of electrical contact resistance of a rhodium-to-rhodium junction. In low power microwave circuits and components a variable contact resistance will introduce spurious signals. When tarnish is present, it gives distortion and partial rectification to information carrying waves. To avoid these problems, engineers specify rhodium on relays, connectors and tuned lines, since a good electroplate will remain sulfide and oxide-free under practically all conditions.

The great hardness and wear resistance of rhodium is used by manufacturers of printed circuit switches, commutators and slip rings (Figs. 2 and 4). High speed computer printed switches with as little as 0.000020 inch of rhodium over nickel have passed 100 million cycles. It is not unusual for the printed circuit to physically break before the rhodium plate has worn through. In one case, a very high speed telemetering switch, coin silver contacts gave a useful life of only 4 hours. Electro-

Fig. 3—Some of the many parts that are finished in decorative gold plate to add attractiveness to appliances and other products.

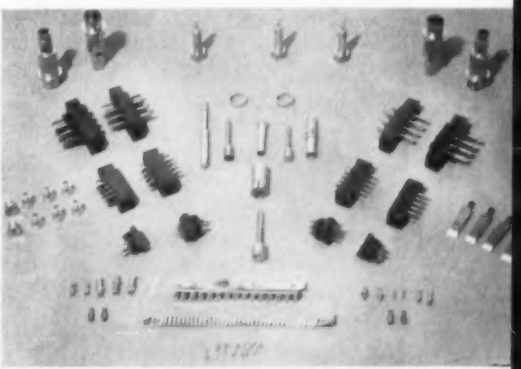

Fig. 4—Gold, gold alloy, rhodium and palladium plated connectors, terminals, contactors and miscellaneous electronic components.

"—many manufacturers have found that a few cents for gold plated trim differentiates their product . . ."

plated bright gold deposits of 0.002 inch gave 20 hours of useful life, while rhodium, 0.0002 inch, allowed the switch to be used for over 100 hours. The life of relay contacts is increased from 50 to 100 per cent by substituting electroplated rhodium for precious metal contact rivets.

Industrial decorative plating, the second new market for electroplated precious metals is used on the ornamentation of automobiles, appliances and a thousand and one items of personal and home use. Three factors have contributed to the rise in popularity of precious metal and particularly gold electroplates. With increasing competition for the consumer dollar, many manufacturers have found that a few cents for gold plated trim differentiates their product and makes it more desirable. A third factor to increase the use of decorative gold has been the emphasis by decorators all over the country on pastel colors and "warm" tones in new homes and kitchens. As a result, furniture and trim is being finished with gold and copper electroplates. Although the thickness of gold used may be as low as half a millionth of an inch, the use of modern epoxy-based baked clear finishes provides satisfactory service life.

Hundreds of household items are now gold plated; nameplates, monograms and trim on washing machines, driers, stoves and refrigerators; clocks, coffee pots, picture frames, can openers, shoe horns, combs and hangers. Even dinette and dining room furniture has been

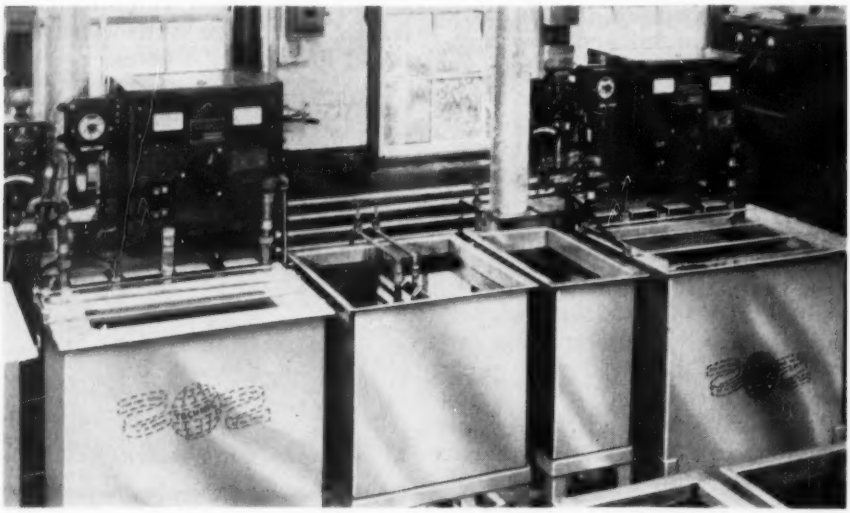

Fig. 5—Controlled precious metal plating tanks being used in gold and rhodium plating.

gold plated. Practically every new automobile sports one or two items of gold plated trim.

With increasing emphasis on office design and color harmony, gold plated items such as staplers, frames, display material, memo clips and even telephone dials have appeared.

The two new markets for precious metal electroplates for electronic components and for decoration on industrial or household items require widely different techniques of plating. In electronics plating the deposits are usually 0.0001 inch and over, in decorative plating they are usually 0.000002 inch and under—frequently no more than 0.0000005 inch. In one the physical properties of the metal are important, in the other only the color.

The electroplater of electronic parts when required to plate 0.0002 inch of a precious metal can not afford to plate 0.0003 to 0.0004 inch to be sure to meet the specification, as he can with copper, zinc, nickel or cadmium. A single small barrel of parts for heavy rhodium plating may require $350 to $400 worth of metal. It is not economical to deposit twice as much as is required.

The main requirement for these new applications of precious metal plating is complete, automatic control of every variable in the plating process. This requirement is equally true for deposits of 0.0000005 or 0.0005 inch. The plater must never rely on guesswork. Control must be absolutely accurate.

The variables to control in precious metal plating are:

1. Temperature.
2. Metal concentration.

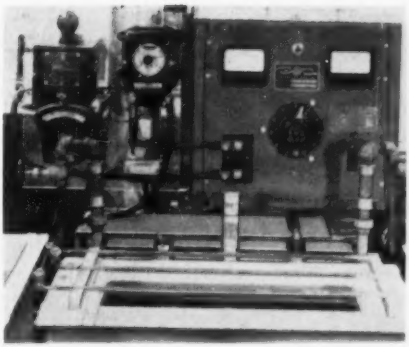

Fig. 6—Details of precious metal plating unit, showing control instruments, alarms, and other devices used in precious metal plating to assure proper conditions and guard against loss of expensive materials. (Photos courtesy Technic, Incorporated, Providence, Rhode Island.)

3. Other electrolyte concentration.
4. Time cycle.
5. Voltage and current density.
6. Agitation.

The ultimate result of control is operation at a constant known efficiency, deposition of a uniform and exact thickness of precious metal and over-all operation at the lowest possible cost.

It is economically impossible to manually and chemically regulate the above variables with the required degree of precision. There are, however several instruments which do give precise automatic control. All modern precious metal plating tanks (Fig. 5) should be equipped with automatic heat controls for temperature regulation, ampere-hour meters for precious metal concentration control, automatic cycle timers for plating time control, and an individual source of direct cur-

"—lacquer coatings are necessary on most items that will be subjected to outdoor exposure or considerable handling."

rent to aid in voltage and current density control (Fig. 6). This wealth of control instruments is not justified economically on base metal plating tanks. However, on precious metal tanks they can pay for themselves within a few months, and often mean the difference between a profitable and an unprofitable installation.

A fully controlled tank is under the complete control of the head plater, supervisor or plant chemist. The operators are guided entirely by visual and audible signals. All the instruments interact to stabilize the cathode current efficiency of the bath. This done, the time will control the thickness of deposit and the ampere-hour meter will control the concentration of metal in the bath. The ampere-hour meter will also indicate the total amount or cost of precious metal used on a run or job lot of work. This gives the head plater an exact figure of metal consumed on which to base cost or pricing figures. In larger plants the ampere-hour meter may be used also in checking production rates and for inventory control.

"Let's not overdo a good thing, Bernhardt!"

Plating Solutions

It is impossible to give one, two or even several formulas and sets of operating conditions that would be both generally applicable and commercially economical. Almost every application requires a different formulation, and variance in plant conditions requires further modification. Cleaning cycles, activation steps, drying techniques, handling methods as well as the basic formulation should be custom designed for each class of work and each plant.

There are, however, certain basic factors that help determine optimum operating conditions. First and foremost is the necessity to keep the precious metal concentration in the plating tank as low as possible. Drag-out losses, even with save rinses and recovery methods, constitute a major dollar loss in dealing with all of the precious metals. Generally speaking, flash decorative still tanks will have as little as 1 dwt/gallon (1/20 ounce) of gold, 5 grams/gallon of rhodium or 8 grams/gallon of palladium. For barrel plating the gold will be as low; rhodium is generally 4 grams/gallon. It is economically unsound to use ½ or 1 oz./gal. of gold to do a job that 1/20 of an ounce will do adequately.

Heavy plating requires higher concentrations of the precious metals for improved brightness, color

and structure of plate. Again, however, the metal concentration should be the minimum required to do the job. For heavy still gold plating 10 to 12 dwts/gallon (0.5 to 0.6 oz./gal.) is usually sufficient. Heavy gold barrel plating may be done from slightly lower concentrations. Heavy rhodium plating, depending on the thickness and the time cycle needed, requires from 8 to 20 grams/gallon. Although much heavy plating is done with higher concentrations, the above values with suitable agitation will produce equivalent quality work.

In gold plating the free cyanide content is also an important factor. Usually, the higher the better with 2 to 3 oz./gal. for decorative plating, and 4 oz./gal. for heavy plating used as maximums for the stated metal values. For thin decorative deposits other considerations must govern the cyanide content. Deposits less than 0.0000025 inch thick are translucent, and the base metal color will influence the color of the gold. If a one millionth inch gold plate is applied over nickel, the result will be a slightly yellow nickel. If economic considerations preclude a heavier gold deposit, a good rich 24K color may be achieved by first flashing the nickel with a green brass (similarly a 14K color may be had by a thin gold flash over a copper flash). As freshly deposited copper and zinc are both very soluble in hot cyanide solutions, gold plating copper or brass tends to contaminate the bath and results in off-color deposits. For this reason flashing over copper and brass should be done from low free cyanide baths. Decorative baths of this type will use $\frac{1}{4}$-$\frac{1}{2}$ oz./gal. and

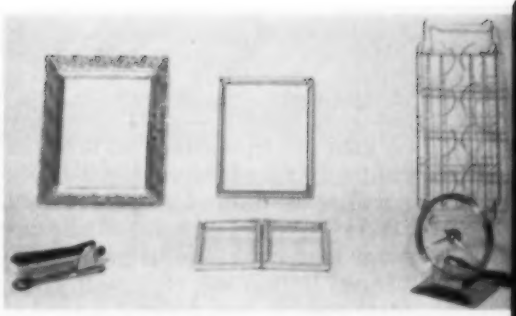

Fig. 7—Another group of items gold plated to improve appearance and sales appeal.

baths for plating printed electronic circuits will operate with as little as 0.02 oz./gal. of free cyanide.

Other considerations varying from job to job will dictate neutral electrolyte concentration, temperature and agitation or absence of agitation. Since all factors interact, one condition or concentration can not be changed alone to determine the optimum operating point.

Clear Lacquer Coating

Very thin decorative gold deposits will not stand much abrasion, and if plated over a copper or brass flash they will give very little tarnish protection. Subsequent lacquer coatings are necessary on most items that will be subjected to outdoor exposure or considerable handling. The life of deposits under 0.000010 inch may be considered to be the life of the lacquer coating. For this reason great care must be taken in the selection and application of the lacquer. The ultimate in protection for both outdoor exposure and severe handling appears to be the baked epoxy type, although the baked vinyl lacquers also give excellent results. For less severe applications

any good quality clear lacquer may be used but care should be taken to ensure that the lacquer selected does not alter the color of the gold or gold alloy. The effectiveness of all lacquers over gold may be greatly enhanced by the use of a clear chromate coating over the gold.

Adapted for publication in PRODUCTS FINISHING from a paper presented before the Baltimore-Washington Branch, American Electroplaters' Society.

★ ★ ★

Metals Handbook, 1955 Supplement. Written by 179 specialists. 208 pages. (214 tables, 256 charts, 411 illustrations) Published by the American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio. Price, $6.00.

This Supplement to the ASM Metals Handbook follows the general plan used in the 1954 Supplement, which is to give practical information on a wide variety of metalworking subjects that require up-to-date reference material. The 21 articles, written by 19 technical committees of the Society, comprising 179 authors, are divided among four main sections: Metals and Applications, Design and Application, Processing and Fabrication, and Testing and Inspection.

A general idea of the scope of subject matter can be had from the titles of a few of the articles: "Selection of Aluminum Alloy Castings," "Selection of Gray Cast Iron," "Selection of Electrodes for Manual Arc Welding of Low-Carbon Steel," "Induction Hardening and Tempering," "Flame Hardening," "Surface Finish," "Gas Carburizing," "Metal Cleaning Costs," and "Radiography of Metals."

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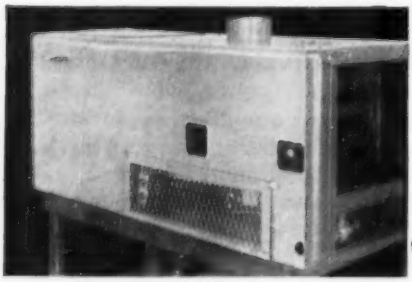
*A PRODUCT OF THE SILICONES



PROTECTS this Heater at Temperatures of 875°F.

Sicon Aluminum protects the combustion chambers of John Zink Heaters against extreme high heats of 875°F. without powdering or losing its gloss.

Sicon, in attractive COLORS, also preserves the OUTSIDE appearance of their products, adding greatly to sales appeal, and prolonging life.

For inside and outside application this amazing silicone base finish provides sure protection plus sales appeal. WRITE FOR DETAILS . . . TODAY!

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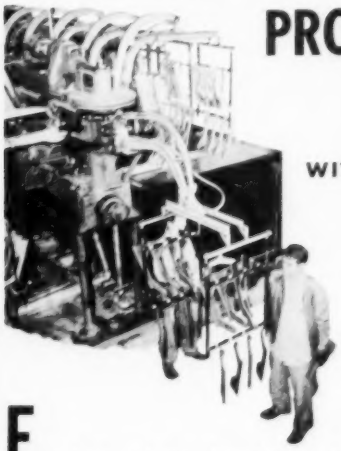
STEVENS *Slants* ON METAL FINISHING

"FROM THE CASTING OR STAMPING TO THE FINAL FINISH"



PRODUCTION JOBBING PLANTS ARE CUTTING COSTS

WITH STEVENS AUTOMATIC PLATING AND PROCESSING MACHINES

• • •

Firms doing production electroplating and immersion processing on a contract basis have found the installation of automatic equipment brings a number of advantages to their operations.

Frederic B. Stevens, Inc., has long paid much attention to the needs of production platers and metal finishing plants and have developed automatic equipment that will fit the needs of any size plant, both from the standpoint of production requirements and capital investment.

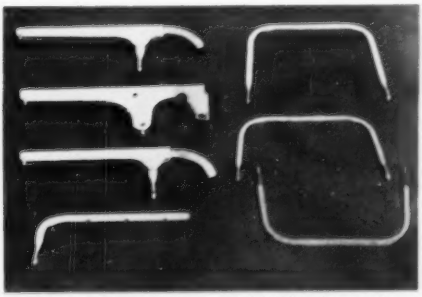
The chief advantages of automatic equipment are:

1. Improved plant layout requiring less floor space and resulting in less time loss by unnecessary movement of the operator.
2. Uniformity of deposit thickness which is especially important where specification electroplating is required.
3. Fewer rejects due to accidental marring of finishes as parts are transferred manually from one tank to another.
4. Unskilled workmen can operate equipment.
5. Better working conditions.
6. Easier chemical control.
7. Easier scheduling of work—better delivery to customers.
8. Lower plating cost per piece.

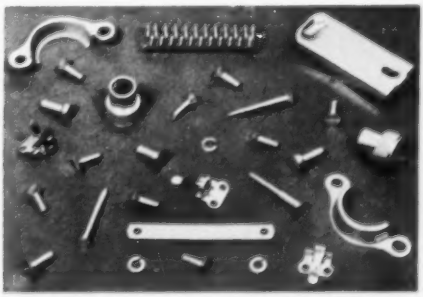
Numerous production shops throughout the United States are now using Stevens automatic equipment. For years the Stevens Model "C" automatic barrel has been a profit maker to platers. It will turn out hundreds of pounds of plated small parts daily.

The machine is versatile and will handle a diversified group of parts—so important to production plants doing contract work.

Stevens "Little Steve" is a new type machine which fits ideally in the production picture. It is a small machine with high production at an initially low cost.



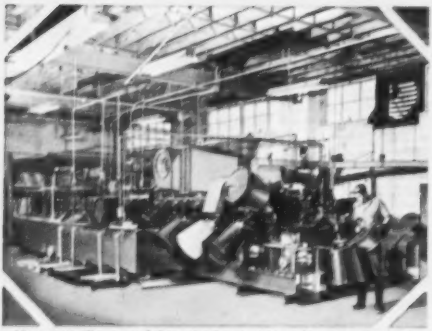
Typical parts plated on a Stevens Model "A" rack type plating in a production plating shop.



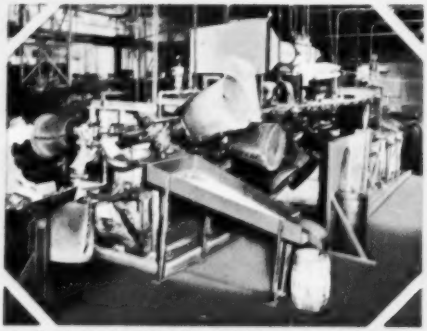
The Stevens Automatic Barrel Machines turn out thousands of pounds of plated small parts daily.

STEVENS Slants ON METAL FINISHING

A page from the
STEVENS SCRAPBOOK
FEATURING AUTOMATION IN PRODUCTION JOBBING PLANTS

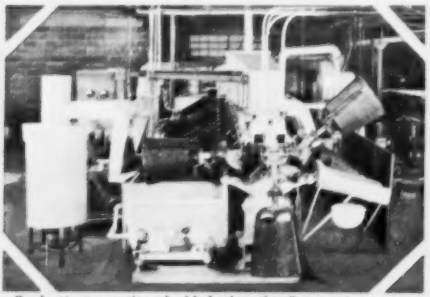


Homer A. Doerr and Son, St. Louis, Mo., plate a variety of small parts in quantity to closer tolerances with this Stevens Automatic Barrel. Operating costs have been reduced.

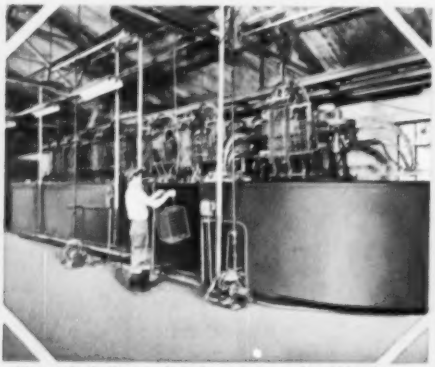


Reilly Plating Co., Melvindale, Michigan, turn out big orders of cadmium and zinc plated small parts with this Stevens Automatic Barrel Machine which gives them faster delivery.

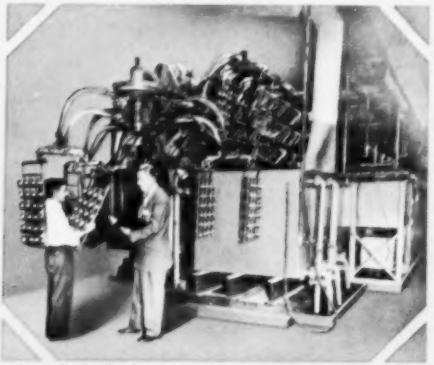
Spectranome Plating Co., Inc., New York City, electroplate fine nickel finishes with this Stevens Automatic Barrel Machine. This machine was the 750th Automatic produced by Stevens.



Production more than doubled when this Stevens Automatic Barrel Plating Machine was installed by Midwest Plating and Chemical Corporation, Kokomo, Indiana



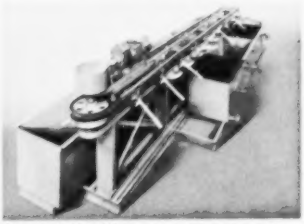
Plating both Zinc and Cadmium parts, the Olds Plating Corporation, Detroit, Mich., finds this Stevens Model "A" Plating and Processing Machine keeps deliveries rolling.



New England Plating Co., Worcester, Massachusetts, do nickel plating dichromating quickly – economically on Stevens Automatic Plating and Processing Machines.

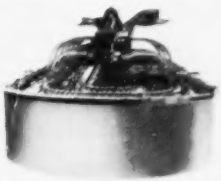
STEVENS Slants ON METAL FINISHING

STEVENS MACHINES FOR PRACTICAL JOB-SHOP AUTOMATION

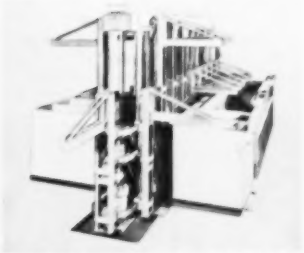


Low initial and low operating costs are features of this newly introduced small automatic which has a big capacity for its size.

A proven automatic barrel machine for plating and processing small parts. Only unit with fully automatic load and unload features.



A compact automatic processing machine, embodying the famous Stevens auxiliary cam shaft and lifters for rapid vertical transfer.



Unit's load capacity, mechanical flexibility and lift design meet tomorrow's increased safety and production requirements.

"LITTLE STEVE" PAYS OFF

THE FINISHING TOUCH

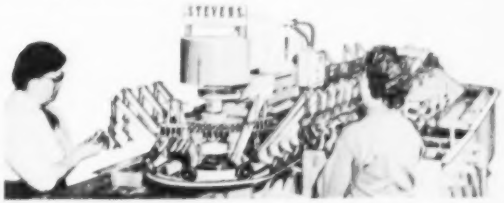
by A. B. HOEFER
vice president
FREDERIC B. STEVENS, INC.

Production Plater Finds Machine Ideal For Zinc Plating

There's a feeling of satisfaction among the people in our company when a Stevens machine is installed and does a better job than the customer anticipated. That feeling reaches all the way from President through engineers, salesmen and typists who write up the specifications.

We are particularly proud of an installation of one of our "Little Steve" machines made recently for the Miller-Smith Manufacturing Company, Spring Lake, Michigan. The partners, John Miller and George Smith, are operating an aggressive business in job buffing and plating, and after receiving some of our literature including a story on the "Little Steve," soon made a purchase from us.

The "Little Steve" fit ideally into their program. The capital outlay met their requirements and the machine is daily turning out a big quantity of zinc plated parts for them. In fact, 105,000 can be plated each working day, which right now is an around-the-clock operation. Just as soon as new racks are built they expect to double present production on some of the parts.



The Miller-Smith management tell us that they are operating much more efficiently now than they did previously with a competitive machine. Parts are being zinc plated to a .0002 thickness every three minutes. They are saving on valuable floor space too, for the "Little Steve" occupies only 162 square feet as compared to 441 square feet used by their previous equipment.

When we asked for comments about the "Little Steve" from Messrs. Miller and Smith, they said: "We are well pleased with the machine —in fact, we're proud of it. We'll be glad to recommend it to anyone." While we are not unused to such comments on our various machines, each new one gives us a warm glow of satisfaction.

This efficient machine fits easily into existing factory layouts because of its size. Only seven feet wide and ten or more feet in length, it can be placed on a factory floor without moving existing machinery.

For further information write to Frederic B. Stevens, Inc., Detroit 16, Michigan.

FREDERIC B. STEVENS INCORPORATED
YOUR METAL FINISHING SUPERMARKET
DETROIT 16, MICHIGAN

METAL FINISHING EQUIPMENT AND SUPPLIES FROM CASTINGS OR STAMPINGS TO FINISHED PRODUCT

BRANCHES:
Buffalo • Cleveland • Indianapolis • New Haven

STEVENS *Slants* ON METAL FINISHING

TIPS AND TATTLE

While there has been automation in plating for a good number of years, it has been only recently that the big trend has been to *complete* automation. This means automatic load and unload of parts in a continuous flow of production operation. F. B. Stevens, Inc., has developed several load and unload devices, which might be added to existing plating equipment. Why not check with our engineers?

• • •

McGraw-Hill's survey of business for 1956 estimates a 13% gain in industrial and commercial outlays for construction and for new equipment. New orders and the backlog on our books indicate that plating and processing machines will play an important part in these gains.

• • •

The meteoric rise in use of aluminum is being met by Stevens with automatic machines for bright dipping, anodizing and dyeing of various fabricated parts. We were privileged, recently, to see an advance proof of an article to appear soon in the magazine *Modern Metals* on aluminum finishing by Light Metal Processors, Inc., Chicago, Ill. If you are interested in aluminum finishing, we think you will find it interesting. If you do not have this magazine available, write us and we will obtain a reprint for you.

• • •

Helpful toward greater shop productivity are Stevens L.V. reports. These reports tell you the type of buffs, speeds, compositions to use on specific buffing and polishing jobs. These reports are a free service by F. B. Stevens, Inc.

• • •

We have for distribution three interesting reprints on subjects of interest to plant managers and others concerned with metal finishing operations. These articles cover: "Automatic Barrel Zinc Plating" – Unistrut Corporation – *Iron Age* – "Continuous Flow Automatic Barrel Washing, Zinc and Cadmium Plating" at Shakeproof, Inc., division of Illinois Tool Works – *Steel*.

And the design features of the new "Stevadoer" that were the basis for the *Modern Design* award presented to Frederic B. Stevens, Inc.

Write for your copies today.

NEW MERCHANDISING SERVICE FOR PRODUCTION PLATERS

• • •

Does your company promote to customers the fact that you have modern automatic equipment for electroplating in your plant? Do you tell them that your equipment insures better metal finishes at closer tolerances?

If you believe such promotion will be helpful, and if you now own or are preparing to purchase Stevens automatic equipment, Stevens is prepared to assist you in such mailings.

Illustrated above is a two-color mailer which we will furnish to you *without charge*. It will contain an imprint of your company name and an illustration of the Stevens automatic plating machine you have installed. All you need do is furnish us with a photograph of the Stevens machine and your correct company name and we will imprint and ship the quantity you desire all ready for proper addressing.

This type of advertising tells your customers that you have the finest equipment available. That you can make fast delivery of quality plated parts–that plating thicknesses are uniform–that the work is done automatically with exacting timing. The human element is eliminated.

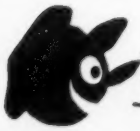
FREDERIC B.
STEVENS
YOUR METAL FINISHING SUPERMARKE

COMPLET:

Pickling Pete's One smart Turk Picks Monel -Easy to work!

Easy to make up in the first place! Easy to repair years later! That's Monel! It's strong, too . . . and handles pickling acids with ease. Learn more about lightweight Monel equipment in free booklet, "5-Way Savings in Pickling."

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.



INCO TRADE MARK **Monel** Pickling Equipment

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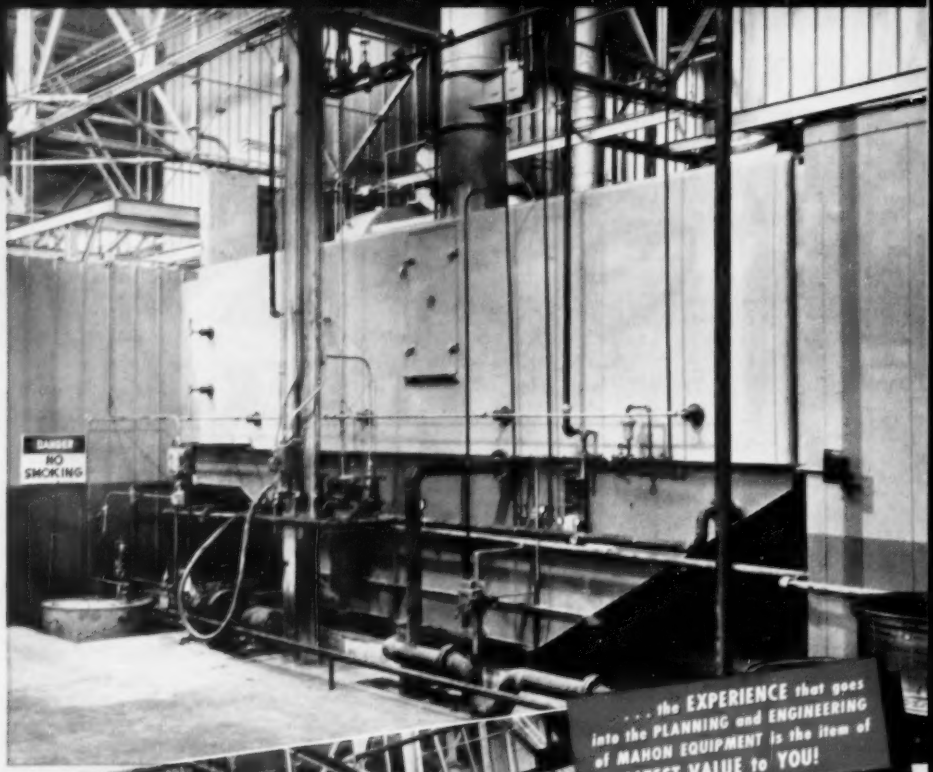
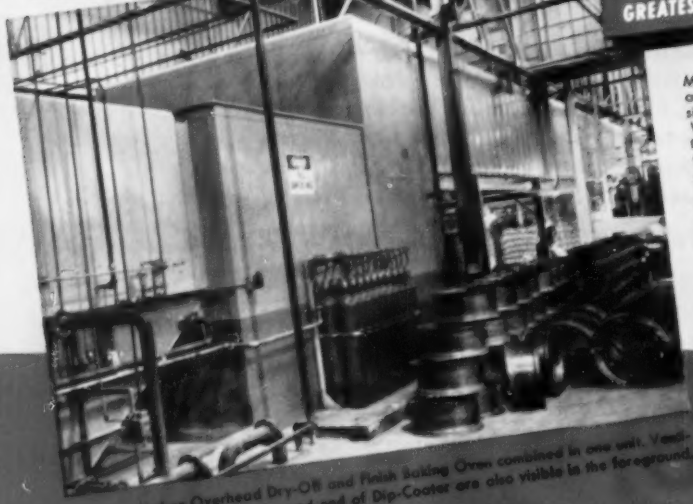
COMPLET



. . . the EXPERIENCE that goes into the PLANNING and ENGINEERING of MAHON EQUIPMENT is the item of GREATEST VALUE to YOU!



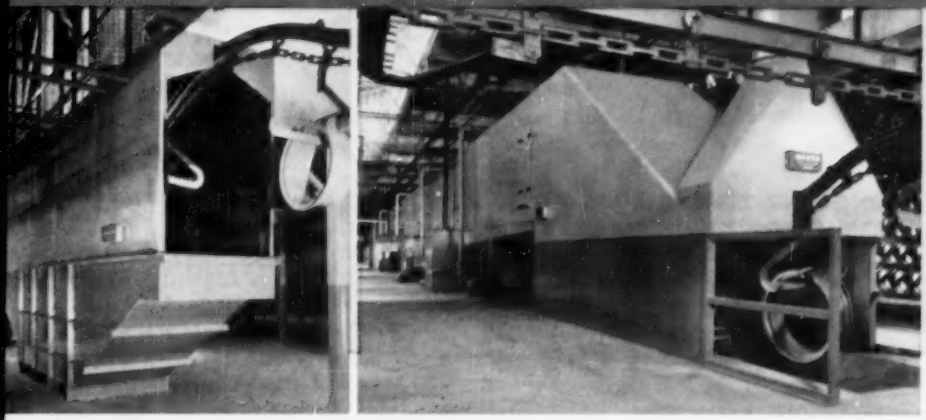
Mahon Overhead Dry-Off and Finish Baking Oven combined in one unit. Ventilated Drip Enclosure and end of Dip-Coater are also visible in the foreground.

At extreme right above is the Mahon Six-Stage Metal Cleaning and Rust Proofing Machine designed especially for the Truck Wheel Rim Finishing System illustrated here. Next is a Mahon Dip-Cooling Unit designed to expedite cooling of Rims emerging from the Finish Baking Oven to handling temperature. Directly above is the Mahon Dip-Coater for applying Epon Paint to Truck Wheel Rims. A paint mixer and other facilities are provided to maintain the Epon Paint at a constant controlled temperature.

M

Finishing SYSTEMS

. . . for ENAMELS • LACQUER • PAINT • VARNISH



Complete MAHON FINISHING SYSTEM Designed Especially to PROCESS and FINISH Truck Wheel RIMS at MINIMUM COST!

Illustrated here are major units of processing equipment which, with other facilities, make up a Complete Mahon Finishing System designed especially for coating truck wheel rims with Epon Paint. The system includes a Six-Stage Metal Cleaning and Rust Proofing Machine, Blow-Off and Drying Facilities, Cooling Tunnel, Dip Coater, Ventilated Drip Enclosures, Filtered Air Supply System, an Overhead Finish Baking Oven, which has a one-pass section for Dry-Off after Bonderizing, and a Dip Cooler. This is another typical Mahon solution for a manufacturer with a particular finishing job . . . it produces a fine, durable finish in minimum time with a minimum of attention, and does it at an absolute minimum cost per unit painted. If you have a finishing problem, or are contemplating new finishing equipment, you, too, will find that Mahon engineers are better qualified to advise you on both methods and equipment requirements . . . and better qualified also, to do the all-important planning and engineering of equipment —which is the key to fine finishes at minimum cost. Whether you require a Complete Finishing System for Spray Painting—either Manual or Electrostatic, Flow Coating or Dip Coating, you will find, if you investigate, that Mahon equipment will serve you better . . . because, Mahon equipment is engineered better and built better for more economical operation over a longer period of time. You can rely on Mahon to do the complete job on one contract—undivided responsibility for the entire system insures proper coordination, and safeguards you against complications which may upset your production schedules. See Mahon's Insert in Sweet's Plant Engineering File, for information, or write for Catalog A-656.

THE R. C. MAHON COMPANY • Detroit 34, Mich. • New York 17, N. Y. • Chicago 4, Ill.

Engineers and Manufacturers of Metal Cleaning and Pickling Equipment, Metal Cleaning and Rust Proofing Equipment, Spray Booths, Flow Coaters and Dip Coaters, Drying and Baking Ovens, and Complete Conveyorized Finishing Systems.

MAHON

Preparing and Painting Zinc Surfaces

By ERNEST W. HORVICK
The Ameican Zinc Institute

ZINC AND ZINC ALLOYS RESIST CORROSION well and normally require no coating of any kind for protection. However, the range of colors and textures available in modern organic finishes is so broad and these colors have such a wide sales appeal that today relatively few metal articles reach the market place in their natural finishes.

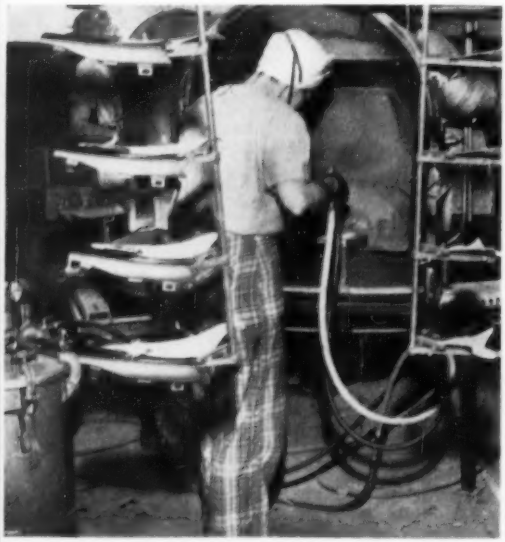


Fig. 1—Automobile die castings being spray painted at the Kalamazoo plant of the Precision Castings Company, Kalamazoo, Mich.

In setting up a finishing system for zinc and its alloys two major points must be considered after a finish having a suitable color and appearance has been chosen: (1) whether the selected coating will satisfactorily withstand the destructive agencies which the finished part will encounter in service, and (2) whether the adhesion of the coating will be satisfactory throughout the life of the article.

The choice of finishing material type is largely governed by the service conditions for which the die casting is intended. The manufacturers of lacquers and enamels have given the formulation of organic coatings a great deal of attention and it is advisable to follow their suggestions. They have developed primers that adhere well to pretreated zinc and zinc alloys, and which may be used in conjunction with a large variety of coating materials. This procedure permits the finisher to select his coatings from a very broad field.

The organic coatings commonly applied to metals fall into two gen-

eral classes: those which harden at room temperature and those which require baking. In general, the baking type finishes have been found to be more strongly adherent to zinc than the air drying type. In either case a chemical or mechanical pretreatment of the metal surface is desirable to obtain best results.

Good adhesion and satisfactory service cannot be expected of any organic coating unless the metal surface on which it is applied is thoroughly cleaned. This is true not only of zinc but of all metals. Even where chemical pretreatment is used the work must be cleaned if uniform attack by the pretreating solution is to be produced. Proper cleaning involves the complete removal of the dirt and grease picked up during fabrication and handling as well as the removal of oxide and other films developed during storage or in the cleaning operation. For this purpose there are now in use in the finishing industry a number of methods.

Alkaline Cleaning

Grease and other surface contaminants may be removed by alkaline cleaning. Many proprietary alkaline compounds have been developed for cleaning zinc prior to electroplating and these should be suitable for use in an organic finishing cycle. The use of a solution of 4 to 6 ounces of tri-sodium phosphate per gallon of water is suggested. This solution should be maintained at about 180 deg. F. and sufficient current should be passed with the article as cathode to cause violent gassing. The treat-

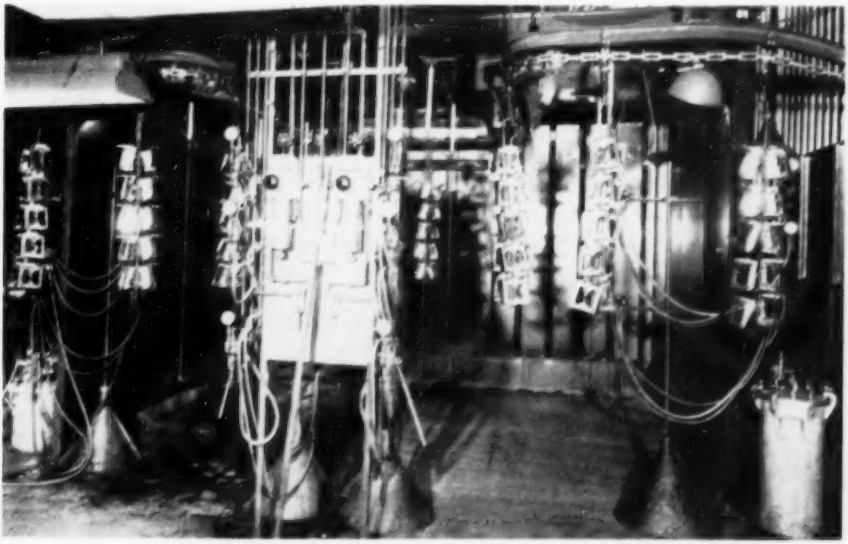


Fig. 2—Zinc die castings being painted in electrostatic spray painting system. (Photos courtesy Precision Castings Co., Kalamazoo, Mich., and American Zinc Institute, New York 17, N. Y.)

ment should remove all grease and oil in a matter of a minute or so, the exact time depending on the type and amount of contaminating material present. Alternate rinsing in hot and cold water should follow to remove the adhering cleaning solution.

Alkaline cleaning, whether electro or immersion, develops a thin film of alkaline zinc salts on the surface of the zinc which cannot be effectively removed by rinsing alone. A brief immersion of perhaps five seconds duration in a cold 10 per cent hydrochloric acid solution will usually remove both the alkaline film and the oxide film. A hot water rinse should follow this dip to facilitate drying. Note that if the cleaning treatment is to be followed by chemical pretreatment, the above dip will not be necessary.

COROCRETE
A NEW CORROSION PROOF SURFACING FOR FLOORS
You obtain greater protection...and save dollars...when you specify COROCRETE. Applied over concrete like cement topping, it can be furnished in various grades to resist virtually *every type of solvent* as well as most acids or alkalies. Once applied (in ¼-inch to ½-inch recommended thickness) COROCRETE cures in a few hours to a dense, impermeable, nondusting surface. A letterhead request will bring a sample of COROCRETE and / or a copy of the new technical brochure illustrated below.
Resists Acids, Alkalies, Solvents
Resists Impact
Costs Less Than Acid-Proof Brick
4-Times Greater Than Concrete
Write today for all the facts.
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MONOLITHIC CORROSION-PROOF FLOORING
COROCRETE
THE CEILCOTE CO., INC.
4848 Ridge Rd. · Cleveland 9, Ohio
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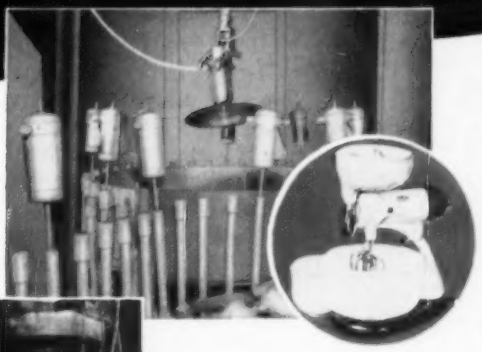
Solvent Cleaning

Fairly effective cleaning can be accomplished by means of organic solvents, such as trichlorethylene, xylene, ethyl acetate, carbon tetrachloride, and so on. To obtain the best results, the solvent must be carefully selected and the method of use must be given ample consideration.

Some solvent cleaning methods depend upon solution of the grease and oil by simple washing or immer-

Sunbeam is particular about the uniform high quality finish on their products, so SUNBEAM relies on

RANSBURG NO. 2 PROCESS
Electrostatic Spray Painting



Along with improving the quality of the brilliant white finish on Mixmaster parts, an 80% paint savings was achieved when SUNBEAM switched from hand spray to RANSBURG Electrostatic Spray Painting

Protective clear lacquer is applied to upper saw guard (upper left) with RANSBURG NO. 2 PROCESS on this line in SUNBEAM's plant 2, Chicago. Other hardware items, including the Drillmaster and Sunbeam Sander are lacquer-coated electrostatically here. Lawn mower parts, such as the handles shown (lower left), the Rain King lawn sprinkler base, and the Sunbeam Fryer base also are painted efficiently with Ransburg No. 2 Process Electro-Spray.

Regardless of the type of product you manufacture, if it's painted—and if your production justifies conveyorized painting—you should look into the savings and improved quality which can be yours with one of the Ransburg Electrostatic Processes. May we tell you about complete Ransburg services, including the test painting of your products in our laboratories?

Write to Dept. P.

Ransburg **ELECTRO-COATING CORP.**

Indianapolis 7, Indiana

RANSBURG

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sion in the solvent. In such cases the last trace of solvent to evaporate from the surface leaves the metal coated with a thin film of grease. Vapor cleaning or vapor rinsing in degreasers using trichlorethylene will overcome this.

Even though vapor rinsing is used, the acid dip discussed above is desirable since it removes any oxide films which might be present.

The finish should be applied following the treatment cycle as quickly as possible, since clean zinc surfaces exposed to the atmosphere for several days gradually accumulate a thin film of zinc oxide and atmospheric dirt which deters adhesion.

Chemical and Mechanical Pretreatments

Chemical pretreatment involves the use of phosphate solutions which are applied to the properly cleaned article either by dipping, spraying or brushing. Proprietary solutions are available which produce on the surface an adherent film of zinc phosphate that is remarkably effective in improving the adhesion and adhesion retention of organic coatings. In using solutions of this type, the instructions supplied by the manufacturer should be followed. Special care should be taken that the film deposited on the article is not excessively thick since this may require additional coats of enamel to satisfy the absorptive properties of the phosphate coating and ensure a finish of the desired appearance.

Use may also be made of chromate films, formed by proprietary

DETROIT "TAC" RAGS GIVE APPLIANCES THAT "MILLION DOLLAR LOOK"

DETROIT "TAC" RAGS are an absolute necessity for cleaning any metal, wood or plastic surface before painting. Removes all dust, lint and sanding particles. Order today through your supplier.
STANDARD OF THE FINISHING INDUSTRY SINCE 1934
DETRO MFG. & SALES CO., INC., CULVER CITY, CALIFORNIA

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POCKET **HANDI-GAGE**

A MAGNETIC THICKNESS TESTER

for electrodeposited, hot-dipped and painted coatings on steel. No bigger than a fountain pen, but what a job it does! Tests plated, painted, enameled, or plastic laminated coatings in SECONDS—in the lab or on the production line. Accurate, quick and easy to use.

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Platers Research Corporation

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FOR A BRILLIANT,

Tarnish-Proof Finish

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BAKER & COMPANY, INC. **PRECIOUS METALS**

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processes. These films impart corrosion resistance to unpainted areas of the same piece. Satisfactory initial adhesion and retention of adhesion will be obtained with many baking finishes. Air drying finishes generally do not adhere as well.

Where the required equipment is available, sandblasting either with sand or grit can be an effective treatment of a metal surface prior to the application of an organic finishing material. Grease and oxide films are removed effectively, and the roughened surface produced by the sandblasting promotes good adhesion. Experience indicates that the use of relatively fine sand or grit is best, although the optimum particle size has not been determined. Material passing through 80 or 100 mesh has proved most effective on zinc die castings and is considered standard by some finishers who have investigated the subject. Sand and grit blasting, however, are definitely limited in their application as a pretreatment of zinc die castings. Because this treatment leaves a relatively rough surface, several coats of an enamel of good filling properties may be necessary if a smooth, glossy finish is desired. Because of this, chemical pretreatment is frequently preferred.

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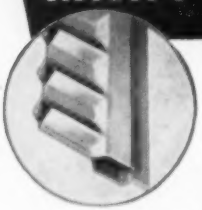
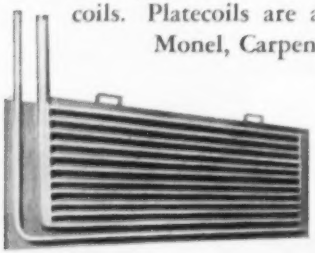
For Process Heating and Cooling

NOW AVAILABLE IN MANY NEW METALS



to multiply heat transfer savings

Platecoil design and construction make possible use of corrosion-resistant metals that are too expensive to use in bulky old-fashioned pipe coils. Platecoils are available in Stainless Steel, Monel, Carpenter 20, Hastelloy B, Hastelloy C, Ampco, and Nickel in addition to cold rolled steel.



For more information on Platecoil advantages, send today for Bulletin P50.

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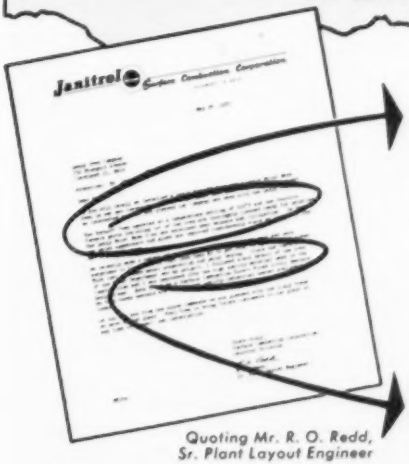
Janitrol Surface Combustion Corporation

COLUMBUS 16, OHIO



Quoting Mr. R. O. Redd, Sr. Plant Layout Engineer

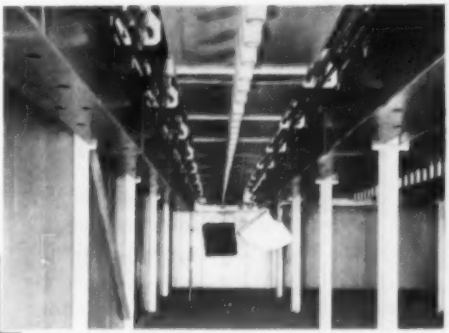
The LANLY Paint Bake Oven

HAS EXCELLENT HEAT BALANCE AND CIRCULATION. IN FACT OUR PAINT APPEARANCE AND GLOSS HAS IMPROVED CONSIDERABLY SINCE WE INSTALLED THE NEW LANLY BAKE OVEN

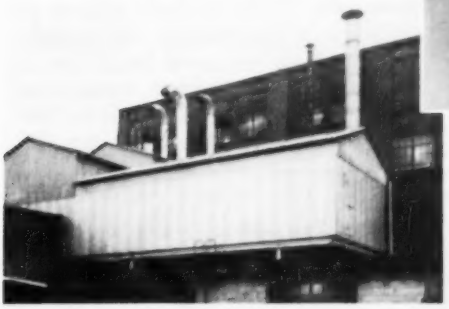
I was impressed with the high quality material used in the Lanly ovens.

Another of the nation's leading manufacturers attests to the efficiency and multi-fold merits of their LANLY OVENS.

Illustration below shows the ingenious manner in which LANLY engineers with the cooperation of The Surface Combustion organization, circumvented the problem of available factory floor space.



Showing a partial conveyor run in the LANLY low temperature paint bake oven.



YOU TOO CAN DO A BETTER JOB WITH LANLY OVENS

Write for the Lanly Catalog

LANLY FINISHING OVENS

THE LANLY COMPANY • 770 PROSPECT AVE

CLEVELAND, OHIO

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Table I

Metal	Maximum Temperature — deg. F. for Total Baking Time of ½ hour	1 hour	2 hours	3 hours
Soft rolled unalloyed zinc	300	300	300	300
Hard rolled unalloyed zinc	230	230	230	230
Soft rolled alloyed zinc	480	480	480	480
Hard rolled alloyed zinc	300	300	300	300

It should be emphasized that the temperatures given for soft rolled zincs can safely be used only when the material is in the form of flat strips or fabricated objects involving minor degrees of deformation. Fabricated objects subjected to relatively severe deformation during fabrication should be baked in accordance with the limits set for hard rolled zincs.

Baking Temperatures

Most modern finishes are either force dried or baked, which adds to their durability and adhesion. It is only natural that since zinc is a metal of relatively low melting point, some attention must be paid to the possible influence of high baking temperatures on the material.

In the case of rolled zinc it is somewhat difficult to set any definite limits as to permissible baking temperatures and times because these will vary to some extent with the size and shape of the article, the degree of deformation involved in fabrication, and with the requirements for physical properties. The temperatures listed in Table I should not be exceeded if minimum changes in properties are essential.

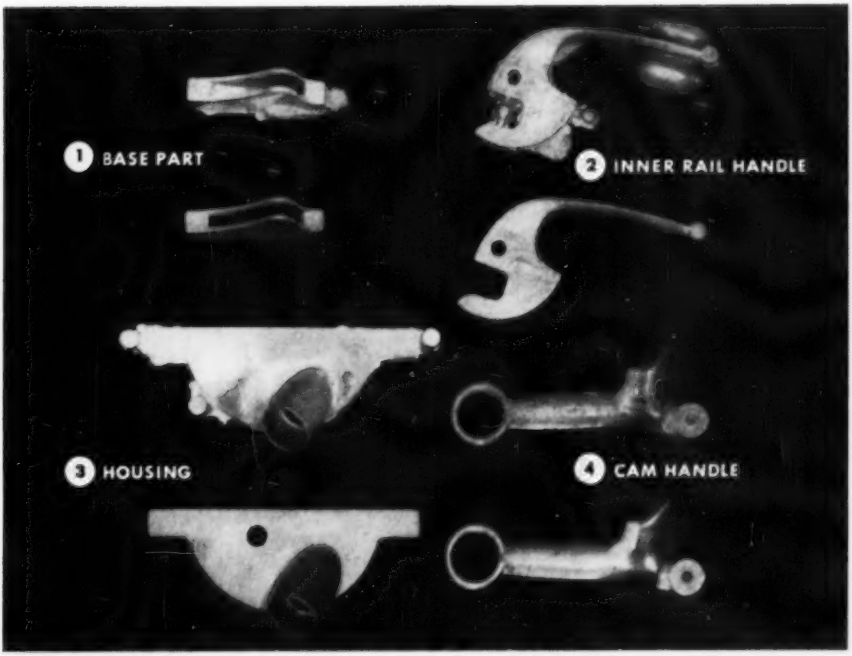
The problem of maximum safe baking temperatures for zinc die castings has largely been eliminated through the development of synthetic resin finishes which can be baked to suitable hardness in one hour or less at temperatures between 200 and 300 deg. F. or in 15 minutes or less at higher temperatures.

There are some cases, however, where organic finishes are to be applied over suitably prepared zinc surfaces and baked in an existing finishing system which involves temperatures higher than those already discussed. While a high degree of stability of dimensions and properties has been achieved in the modern zinc alloys under conditions of service at temperatures between room and about 212 deg. F.,

Table II

Alloy	Maximum Temperature — deg. F. for Total Baking Time of ½ hour	1 hour	2 hours	3 hours
Zamak-3*	425	375	325	300
Zamak-5**	425	375	325	300

* Corresponds to A.S.T.M. Alloy XXIII, S.A.E. No. 903
** Corresponds to A.S.T.M. Alloy XXV, S.A.E. No. 925



Nationally known window manufacturer finds:

HONITE Method cuts finishing costs on aluminum die castings up to 96%

1. COST CUT 96.3% on trimming a base part for a jalousie window unit. Old hand method cost .0027¢ per unit: HONITE Method costs .0001¢ per unit.

2. COST CUT 96% on smoothing a jalousie window inner rail handle. Old hand grinding method cost .015¢ per unit: HONITE Method costs .0006¢.

3. COST CUT 78% on trimming a housing for a jalousie window unit. Old hand method cost .0055¢ per housing: HONITE Method costs .0012¢ per housing.

4. COST CUT 96% on polishing a cam handle for a jalousie window. Old hand grinding method cost .015¢ per unit: HONITE Method .0006¢.

You can cut costs with the HONITE Barrel Finishing Method, too! Call your HONITE Field Engineer today. Or write to Minnesota Mining and Manufacturing Company, Dept. FI-26, St. Paul 6, Minn., for FREE copy of booklet: "Facts and Figures Report on HONITE Barrel Finishing."

Honite BRAND — PRODUCT OF 3M RESEARCH

Made in U.S.A. by Minnesota Mining and Mfg. Co. General Offices: St. Paul 6, Minn. In Canada: P.O. Box 757, London, Ontario. Export Sales Office: 99 Park Avenue, New York City. Makers of "SCOTCH" Brand Pressure-Sensitive Tapes, "3M" Adhesives, "Safety-Walk" Non-slip Surfacing.

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it is known that this stability can be destroyed by exposure of the castings above certain maximum temperatures in baking. To prevent this undesirable effect, which is completely independent of blistering of the casting or of copper-nickel-chromium deposits, it is necessary to observe the restrictions on temperature and time in Table II.

The organic coatings considered in the preceding parts of this article are largely used over zinc alloy die castings for purposes of decoration. Such coatings provide ready means of creating and retaining a desired appearance.

Zinc has been used as corrosion resistant material for more than a century. In ordinary atmospheres it does not corrode rapidly, but it does assume a grey appearance which is unsuitable for many applications. However, when exposed to stagnant moisture or condensation with limited access to oxygen, a non-uniform type of corrosion may occur which often results in the formation of a bulky film of white corrosion products. This may hinder the operation of parts and in severe cases result in rather rapid loss of zinc. A number of chromate treatments have been developed to over-

to page 50→

CASE HISTORY

THIS MANUFACTURER PUT THE SCREWS ON

Swift PLATING COMPOUNDS!

To meet competition, a large East coast screw manufacturer* needed brighter zinc and cadmium finishes —gleaming finishes that would not lose their eye and buy-appeal on the dealers shelves.

Swift recommended a specific finishing compound—finished screws so effectively that they remained as bright as the day they were dipped —FOR YEARS.

*name on request

Swift can fill your needs for super finishes—**Aluminum, Copper, Cadmium, Zinc, White Brass.**

Send for Technical Bulletins and catalog sheet today!

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ALBANY TURNPIKE BOX 301 • CANTON, CONN.

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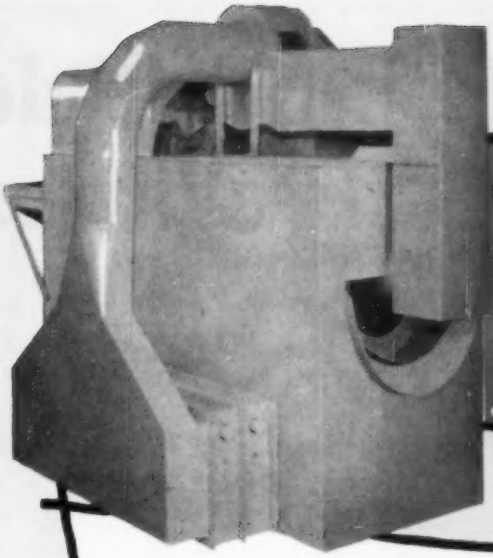

Bone Dry..
Up To 900 Quarts Of Parts Per Hour
...Automatically!

LASALCO's *New*
SPIRAL DRYER

SPECIFICATIONS

SIZE: Length 9' 0", Width 4' 6", Height 6' 0"

DRUM SIZE: 22" Diameter, 72" Long, 9" Screw

DRUM PERFORATIONS: ½" (Other sizes available)

DRYING TIME: (Aver.) 3-5½-9½ minutes

PRODUCTION: 30 to 900 Quarts per hour (40 to 120 cubic feet)

DRIVE: ½ HP 220/440 volt, totally enclosed ball bearing motor, 1200 RPM

DISCHARGE CHUTE: 20" From Floor (minimum)*

LOADING CHUTE: 42" From Floor

HEATER: Steam—Aerofic blast coils with 1 HP fan for recirculation of air. (Also available with gas heat.)

*Can be arranged for any height from tote pan to 55-gal. drum.

- Virtually eliminates *all* drying labor.
- Hot blasts parts completely dry over a 3-speed spiral—automatically—regardless of design, recesses or contours in the work.
- Automatically unloads into barrels or tote pans. Instantly ready for the next load.
- Specially designed heater eliminates all moisture from the air.
- Replaces up to 3 sawdust tumblers plus 2 or 3 centrifugal dryers.
- Can be arranged to take full hopper loads from final hot water rinse without handling.

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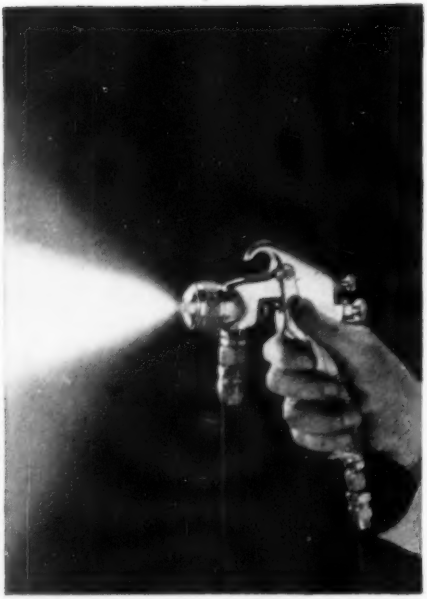
Telltale DeVilbiss



COLD SPRAY

Paint sprayed cold often looks like this.

HOT SPRAY

Paint sprayed hot reduces fog, saves material.

photos prove cuts paint waste!

New Hot-Spray method creates less paint fog; saves up to 50% in material

By the application of controlled heat to the material – and spraying at far lower pressures – the new DeVilbiss Paint Heater solves the problem of spray fog, the major cause of spray-material waste. More paint reaches the surface; a heavier paint film can be attained with each application.

So, generally, one hot-sprayed coat covers better than *two or more* coats sprayed cold. Spraying time and material are often cut in half! And finishes? They dry faster, shrink less; come out glossier!

Usable for all types of products, the DeVilbiss Paint Heater can be *your* means to better finishing at lower cost. Call your DeVilbiss supplier, today, for an appraisal of your operation.

For full details, write for Folder F-286.

DeVilbiss Paint Heater permits Marinette Marine Corp., Marinette, Wisc., to effect multiple benefits in applying vinyl paints to U.S. Navy landing craft. Firm reports hot-spray system practically eliminates spray fog, objectionable fumes; allows heavier film build without sags; maintains trouble-free production rate.

FOR BETTER SERVICE, BUY
DEVILBISS

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"—dip in solution containing hexavalent chromium ions forms protective film . . ."

come this condition. One of these is the Cronak* process.

In any environment where films of condensed moisture can form and dry slowly, the layer of white corrosion products which develops frequently will be heavy enough to bind moving parts. Similar heavy corrosion product layers form when zinc is held in contact with stagnant water. Typical of this type of exposure is the automotive carburetor in which a pool of water may become trapped under the gasoline.

* U. S. Patent 2,035,380. Applications for license and for full details of the process should be addressed to The New Jersey Zinc Co., 160 Front St., N. Y. 38, N. Y.

"He Ever Try Cleaning His Spray Gun?"

The Cronak process is a means of minimizing the corrosion of zinc and the formation of heavy corrosion product films under adverse exposure conditions. The process consists of a simple dip in a solution containing hexavalent chromium ions and results in the formation of a protective golden brown film usually showing some iridescence.

While the primary use of the Cronak process is to provide protective films, there are occasions where the films serve as a base for organic coatings. Such occasions arise with parts on which some areas are to be protected by Cronak films while others are to carry decorative organic coatings. The adhesion and retention of adhesion of baking enamels to Cronak films appears to be satisfactory with the majority of such enamels, and furthermore, adequate commercial experience has been reported for these combination coatings. It must be pointed out, however, that the possibly deleterious effect of the baking temperatures on the Cronak film has not yet been fully evaluated.

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INDIVIDUAL PIECES • ANY SIZE OR SHAPE

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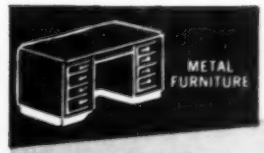

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touch up your products anytime, anywhere... factory-perfect job every time!

YOUR OWN FINISH FROM YOUR OWN SOURCE

In use by industrial leaders in every field, the Sprayon Self-Spraying Touch Up Tool ends your touch up problems. Protect the eye-appeal of your product—get an extra bonus of customer satisfaction—and do it with big savings in time, cost and equipment investment! Sprayon goes right to your source for your own touch up finish, custom-loads the Tools for you under your own label. Exclusive Sprayon features mean even unskilled help do a factory-match job in minutes...for pennies. Use it anywhere—from your own production line to the final customer. Nothing else to buy—it's a disposable low-cost constant-pressure spray gun—a complete paint shop in a can!

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SPRAYON *Self Spraying* TOUCH UP TOOL

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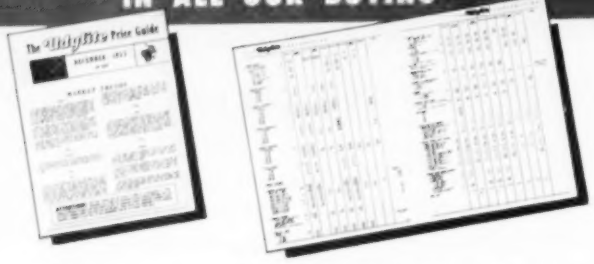
"WE USE THE *Udylite* PRICE GUIDE IN ALL OUR BUYING"



This statement by Phil A. Young, General Manager, Midwest Plating & Chemical Company, Kokomo and Logansport, Indiana, is typical of many busy executives throughout the country.

You, too, should take advantage of this regular buying service for electroplaters. The Udylite Price Guide keeps you abreast of the latest prices with its most complete listing of supplies—and now it lists the current prices from each of the nine Udylite stock points.

Issued bi-monthly, the Udylite Price Guide informs you on market trends, tells you about new items and new methods used in plating. Since its inception in 1945, it has grown steadily in size and circulation to its present effectiveness.

The Price Guide is another free service from Udylite. If your name is not on our present mailing list, send it in immediately. Write The Udylite Corporation, Detroit 11, Michigan, giving your name, address and the company with whom you work.

THE *Udylite* CORPORATION
DETROIT 11, MICHIGAN

WORLD'S LARGEST PLATING SUPPLIER

New Filters

Recently introduced by the Udylite Corporation, a new line of filters answers the demands of the plating industry for fast filtering, low cost, and portability with maximum simplicity of design.

One of the features of the new portable filters is a self-priming pump which saves time and adjustment in getting the filter into operation.

These new Udylite-Detroit Filters also feature a stainless steel pump with a neoprene impeller and a lip seal which can be changed without dismantling the entire machine.

By the simple expedient of reversing the motor of the filter pump, complete back washing can be obtained. This method uses no air and eliminates the necessity for other equipment.

The cake does not drop in Udylite-Detroit Filters when the machine is stopped. By use of a hollow, perforated stainless steel filter plate, filtering is accomplished at high speed.

In addition to the low initial cost of Udylite-Detroit Filters, additional savings are realized in low cost and speed of operation. They give more filtered gallonage per dollar of initial cost and cost of operation.

A New Heavy-Duty Plating Barrel

The Udylite Corporation has announced a new heavy-duty plating barrel, with increased cylinder sizes.

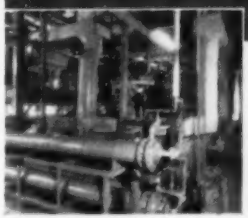
The barrel has a cylinder made of cemented Tempron hard rubber and is furnished in sizes of 16 by 36 inches and 16 by 30 inches, inside dimensions.

The new Udylite Plating Barrel will handle loads up to 400 pounds and will plate surface areas up to 100 square feet, depending upon the shape and size of the work to be plated. As the barrel will draw up to 1500 amperes at 18 volts, tanks are bussed for 1500 amperes. Solution working capacity is 430 gallons.

While the standard specifications of the new barrel plater are for cyanide plating cycles, a barrel is also available for all normal alkaline and acid plating solutions. Where the new plater is to be used for acid plating, Koroseal-lined tanks are usually furnished, although other linings are available.

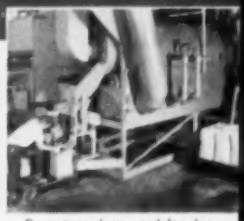
According to Udylite engineers, this new high production barrel is capable of increasing production per man hour from 50 to 100 per cent over barrels of the present standard sizes.

PLATING 400,000 POUNDS A DAY WITH THIS UDYLITE MACHINE . . .



End view showing exhaust system and heat exchangers.

Unloading station of Udylite Automatic Barrel Machine.



Drum type dryer used for drying bright zinc plated work.

Harding Manufacturing Company are bright zinc plating 20,000 pounds of small parts per hour with their Udylite Full Automatic Barrel Plater and are running it 20 hours a day.

Only four men are used in operating this Udylite machine. One man loads the feeder hopper. One man loads the cylinders. One man unloads the cylinders and one man unloads the dryer and dichromating operation—*5,000 pounds of plating per man hour.*

And with this tremendous production is all the desired versatility. The machine is so designed with electrical controls that the plating time and thickness of plating in each cylinder load can differ from other loads going through the machine cycle at the same time. The plating time for each load is predetermined by the operator at the time the cylinder is loaded.

This is another example of Udylite experience in production plating. If you have a plating problem—large or small—it will pay you to consult Udylite.

THE Udylite CORPORATION
DETROIT 11, MICHIGAN

WORLD'S LARGEST PLATING SUPPLIER

finishing clinic

Suggested solutions to problems submitted by readers. Send your problem to our Editorial Staff. There is no charge.

Question: *I am sending you some of the pieces that we are having trouble with to illustrate our problem. These pieces are cadmium plated steel. I'll give you our procedure and maybe you can tell us what we are doing wrong.*

This job is first tumbled, then cleaned, then cold water rinsed, then cleaned, double cold water rinsed, cyanide dipped, double cold water rinsed, and cadmium plated in a medium size barrel. The barrel is then removed from the cadmium solution and placed in a cold running water rinse for 45 minutes. The pieces are then removed from the barrel and put into stainless steel mesh baskets (half full) and then put into a cadmium bright dip (nitric acid and water), double cold water rinsed, hot water rinsed, and then dried in hot air (set in a square stainless steel basket ¼ full, in an oven with hot air blowing downward on the pieces). The cadmium solution has been checked and rechecked. The cyanide metal content and pH are all up to specifications. I would surely appreciate it if you could help us out.

F. L. B.

Answer: Upon analysis of the cadmium solution you may find that it contains a large amount of either copper or some other foreign metal as an impurity. When the solution is treated to remove this impurity, the discoloring stains will no longer be noticed on your plated products. The other possibility is that the nitric acid bright dip is impure. However, that would not seem likely since no doubt you discard the solution each day and make it up fresh each morning.

Rather than use a nitric acid bright dip after cadmium plating, you might be interested in investigating chromic acid bright dipping materials. We are forwarding names of suppliers of such materials.

——— *fc* ———

Question: *In the manufacture of kitchen cabinets and other items for use in kitchens, we are copper plating steel and finishing with an "Epon" material.*

We are having difficulty with brown spotting coming up from the steel through the copper plating, and in an effort to eliminate this problem, which, we understand, is more or less common in this procedure, we would appreciate any information you might be able to furnish.

E. B. H.

Answer: Your difficulty may arise from several sources, namely: impurities in the copper plating solution; improper rinsing following plating; and improper metal pretreatment prior to plating. If the copper plating solution itself is not in good working order, you may be able to eliminate the trouble

by going through hot and cold rinses several times following plating. The final rinse should be one in which a small quantity of a "rinsing agent" has been added so that the water runs off the parts quickly. We are enclosing a reprint of the aritcle "Antique Copper Finish for Modern Gas Ranges," published in the September, 1953, issue of PRODUCTS FINISHING, which may be of assistance to you.

fc

Question: *Please outline some methods for comparing degrees of cleanliness. In other words, "How clean is clean?"*

We have had indifferent success in using detergent washers or vapor degreasers to remove vapor blast mud, buffing compounds or Magnaflux paste, the latter either wet or dry. Can you suggest methods of accomplishing this other than ultrasonic cleaning or hand wiping?

A. F. D.

Answer: There are a number of cleaning compounds which can effectively remove the soils you mention.

The proper test to be used to determine surface cleanliness depends on the particular problem. For electroplating, a water break-free surface fairly free of smut is acceptable. This can be determined by wiping with a clean cloth — a little grayness is acceptable, but a heavy black smut is not. For cleaning prior to porcelain enameling, a water break-free surface is the only test run. This is determined by immersing the clean metal in ½ per cent sulfuric acid solution for a moment, and then rinsing under tap water. Hydrophobic surfaces show up immediately.

For more critical cleaning, tests using radioactive tagged soils, ultraviolet examination, solvent residue tests, swirl tests, and so on, may be used. Most of these require a thorough familiarity with the cleaning field and cannot be satisfactorily evaluated by a chemist unfamiliar with this field.

W. T. W.

fc

Question: *Would you kindly give us some information on the following: We have silver bearing solutions; namely nitric acid, and sodium cyanide and sodium hydroxide, respectively 1 pound and ½ pound per gallon solution.*

Both have been used for silver stripping purposes. Could you recommend a method for recovery of this silver?

W. J. B.

Answer: A favorite method of recovering silver from solutions of this type is to precipitate the silver as silver chloride, allow it to settle, and wash several times with water, after which the material can either be redissolved in sodium cyanide for addition to a silver solution, or can be sent to a precious metal processor to be converted into metallic silver.

More specifically, for the solution of nitric acid which contains silver, the silver may be precipitated by the addition of a solution of ordinary table salt. This may be added a little at a time with stirring until no additional silver precipitates. The precipitate will settle to the bottom of the jar or vessel in question so that the clear solution of nitric acid and excess table salt may be drained off. The precipitate should then be washed as previously described.

The second solution which you mentioned in which silver is dissolved in sodium cyanide and sodium hydroxide must be handled more carefully. This solution should be handled out of doors. Half strength hydrochloric or muriatic acid should be added very slowly and carefully to this solution with stirring. Be careful not to inhale the fumes. When the reaction is complete there will be no further fuming or sputtering with an acid addition. The silver chloride precipitate will settle and the clear liquid may be removed as described.

Improved Method for Applying Cermets

A RAPID PROCESS for applying a common type of cermet coating to a metal base is now in use at the National Bureau of Standards. The cermet powder in this case is a chromium-boron-nickel mixture that is combined with a ceramic frit. The process employs ordinary ceramic coating procedures and provides a hard high-temperature-resistant facing for metal parts. Developed by D. G. Moore and J. R. Cuthill of the Bureau's enameled metals laboratory, the coatings have excellent thermal shock resistance and are reasonably ductile.

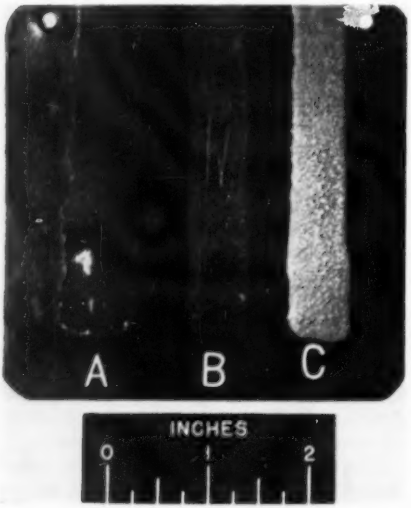


Fig. 1—Heat-resistant alloy specimens coated with chromium-boron-nickel cermets at the National Bureau of Standards. All three coatings were fired for 4 minutes at 1950 deg. F. in air. Coating represented by strip A contained Cr-B-Ni cermet powder only; B contained 100 parts by weight of cermet powder and 5 parts clay, while C contained 90 parts cermet powder, 10 parts NBS frit 332, and 5 parts clay. True welding of the cermet to give a continuous metallic-like layer occurred only in the case of the coating containing frit.

Cermets possess properties of both metals and ceramics. The chromium-boron-nickel types have some degree of ductility, are resistant to thermal shock and oxidation at high temperatures, and retain their strength and hardness at high temperatures as well. In recent years, chromium-boron-nickel layers have been used extensively as hard facings for metal parts, subjected to the severe conditions of erosion and oxidation.

In the NBS process, a slip is prepared from a cermet powder and a ceramic frit. The usual ceramic coating procedure is followed and the slip is applied to the metal part at room temperature by either dipping or spraying. The part is then fired at a temperature above the melting point of both the cermet and the frit. During the firing, the ceramic phase in the coating serves as a flux to permit welding of the cermet particles without the necessity of a highly-purified, oxygen-free atmosphere. Depending on the firing temperature, the ceramic material either "sweats out" to the surface or remains as occlusions in the cermet network, while the cermet particles

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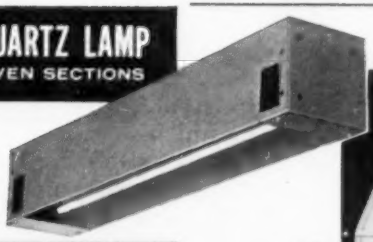
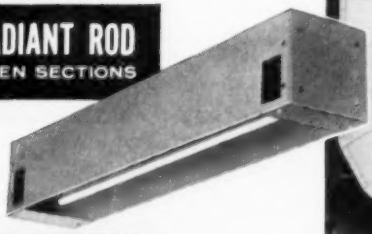


2 RADIANT ROD OVEN SECTIONS



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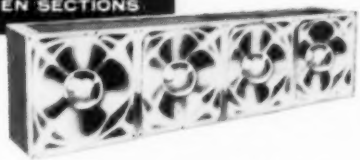

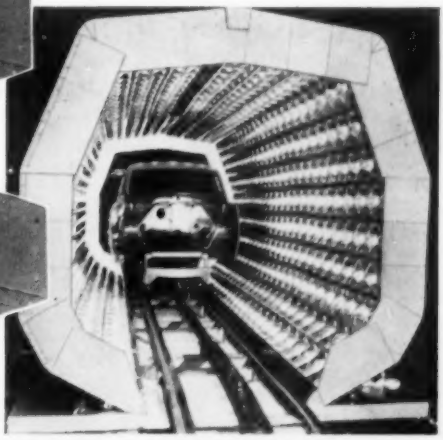

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melt to form a continuous layer that becomes brazed to the surface of the basis metal.

In one series of experiments, coatings with different ratios of frit to cermet powder were prepared and applied to various basis metals. It was discovered that the sweating out of the glassy phase to the surface of the cermet layer occurred at a firing temperature of 1900 deg. F. for coatings which contained 5, 10, or 20 parts by weight of frit. However, a temperature of 2100 deg. F. was required before sweating out occurred with a coating which contained 50 parts by weight of frit. In the cases where sweating out did not occur at all, the glassy phase was found to be enmeshed in a welded network of the cermet material.

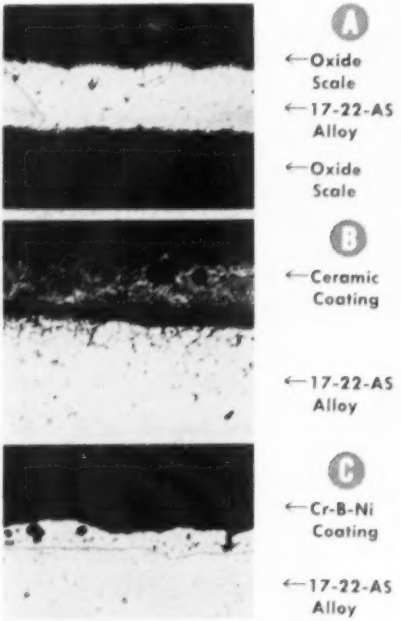
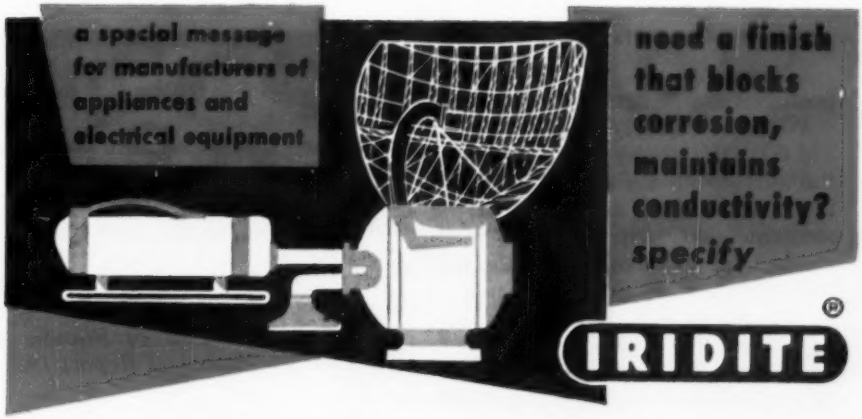


Fig. 2—Micrographs of three low-alloy steel specimens after long-time heating in air at 1500 deg. F. for cermet coating evaluation at the National Bureau of Standards. Specimen A, which was uncoated, shows only a small amount of metal remaining after 400 hours heating. Oxide layer and stringers under NBS coating A-19H on specimen B shows that the protection provided by the coating consisting entirely of ceramic material was not nearly as good as that obtained with M-60F on specimen C. Nital etch x 125. (Illustrations courtesy Natl. Bureau of Standards, Washington, D. C.)

Firing time had little effect on the appearance of the coatings; a coating appears the same after 16 minutes of firing as it does after 2 minutes. Firing in air gave satisfactory coatings on alloys that initially had good oxidation resistance, but a furnace atmosphere of low oxygen content was necessary to achieve satisfactory protection on such metals as molybdenum, ingot iron, and several low-alloy steels.

Neither thorough cleaning nor roughening of the metal surface prior to applying the coating was essential. Satisfactory coatings were obtained on smooth surfaces which had been only mildly degreased.

The coating with the best continuity of the Cr-B-Ni layer, and with the best appearance, was obtained from a mixture of 10 parts of frit, 90 parts of cermet powder, and 5 parts of clay by weight. This coating was designated M-60. With this mixture, coating thicknesses in the range of 0.004 to 0.008 inch can be achieved by single coat application. For thicknesses greater than this range, multiple coatings are recommended. For thinner coatings, finer grinding of the slip is required. Such thin com-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positions are designated M-60F.

With the coarsely ground coating (M-60), the glassy phase forms at the surface of the cermet as small beads when fired according to the recommended procedure. These beads tend to flake off on cooling, but light sandblasting or treating in molten alkali will result in a specimen of more acceptable appearance. On the other hand, when the finely-ground coating (M-60F) is used, and application thicknesses are less than 0.003 inch, the glassy phase that comes to the surface forms a uniform glaze that adheres to the underlying cermet layer. In this case, the specimen appears to be ceramic coated.

The possible use of the M-60F coating for protecting low-alloy steels against oxidation at 1500 deg. F. was also investigated. Uncoated specimens scaled rapidly, whereas the M-60F coating prevented any loss in effective thickness for the maximum test period of 800 hours. However, spectrochemical analysis shows that boron diffuses into the alloy structure during the heat treatments. In one test, the boron content of a low-alloy steel reached 0.028 per cent by weight after the 800 hour treatment at 1500 deg. F.

—*National Bureau of Standards Summary Technical Report 1932.*

★ ★ ★

Zinc plays a vital role in galvanizing, in which it is used to provide a coating of zinc for protection of iron and steel from corrosion. It is used as the base metal in die casting many parts. It is used for drawn and formed products, and for engravers and lithographers' plates. Zinc anodes are used as a "sacrificial" metal in providing cathodic protection for underground and underwater structures. Zinc pigments are used in paints for durability, tint retention, hiding power, gloss and controlled chalking. They are used in rubber for chemical activation and reinforcement.

Table I

BATCH COMPOSITION AND MILLING INSTRUCTIONS FOR NBS CERMET COATINGS M-60 AND M-60F

A) BATCH COMPOSITION

Ingredient	Parts by Weight
Cr-B-Ni powder a/	18
Frit 332 powder b/	2
Enameling clay	1
Water	5

a/ Chromium-boron-nickel cermet powder sized to pass a U. S. Standard 140 mesh sieve and pretreated for removal of lubricant.

b/ Prepared by ball-milling NBS frit 332 in a dry mill until it is sufficiently pulverized to pass a U. S. Standard 40-mesh sieve.

B) MILLING INSTRUCTIONS

	M-60	M-60F
Milling time a/	1 hour	17 hours
Specific gravity of slip for optimum workability	3.25	2.60

a/ In one-gallon ball mill with zircon balls using 1575 g. of dry-coating ingredients and 375 g. of water.

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Electroplating Rotogravure Cylinders

TO AN AVERAGE CITIZEN, the most familiar application of rotogravure printing is the colored supplement section of his Sunday newspaper. This was, in fact, the first large-scale use of rotogravure in the United States, and was responsible for introducing this word as a familiar part of our language.

A principal advantage of rotogravure over most other printing methods is the excellent duplication of tone and shading. In the reproduction of photographs, brilliant contrast can be achieved without loss of clarity, depth, or color. Rotogravure is also particularly well adapted to lengthy printing runs at high speed.

These desirable features of rotogravure have resulted in its adoption for many printing applications in addition to newspaper production. Such uses include the printing of wallpaper, textiles, wrapping papers, oilcloth, linoleum, and foils of metal, cellophane, and other non-paper materials. Boxes and cartons for packaging consumer goods that sell by package appeal are largely printed by gravure. Large-volume runs of calendars, greeting cards, and advertising brochures, as well as high-quality reproductions of paintings and photographs are among the uses of rotogravure.

Rotogravure printing cylinders are more expensive than other printing surfaces, and generally are not economically justified for small jobs. In large-volume printing, however, the cost per unit printed compares favorably with any other process.

Although gravure printing has been used for many years, the industry has not remained stagnant. There have been many process improvements, leading to both better quality and reduction of cost. For most of the information included in this

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paper, the author is indebted to bulletins and announcements of the Hanson-Van Winkle-Munning Co., describing recent developments in rotogravure printing.

Rotogravure Printing

In rotogravure printing, ink is held on the surface of the engraved cylinder in minute depressions. This is in direct contrast to letterpress and offset printing, where the inked surface is raised. The gravure depressions or cells are evenly spaced over the printing surface, approximately 22,000 to the square inch. Gradations of tone are obtained by variations in the cell depth, which may range from 2 or 3 thousandths of an inch for dark or solid tones to as little as a few tenths of a thousandth for light shades and highlights.

In the printing operation, ink held in the depressions of the cylinder surface is transferred to the paper or other web material by capillary action. Transfer is aided by pressure on the paper, between the engraved cylinder and the paper-supporting or impression cylinder. When the printed sheet leaves the cylinders, the ink spreads on the paper before it dries. The extent of spreading depends on the quantity of ink deposited from each cell, hence is a function of the

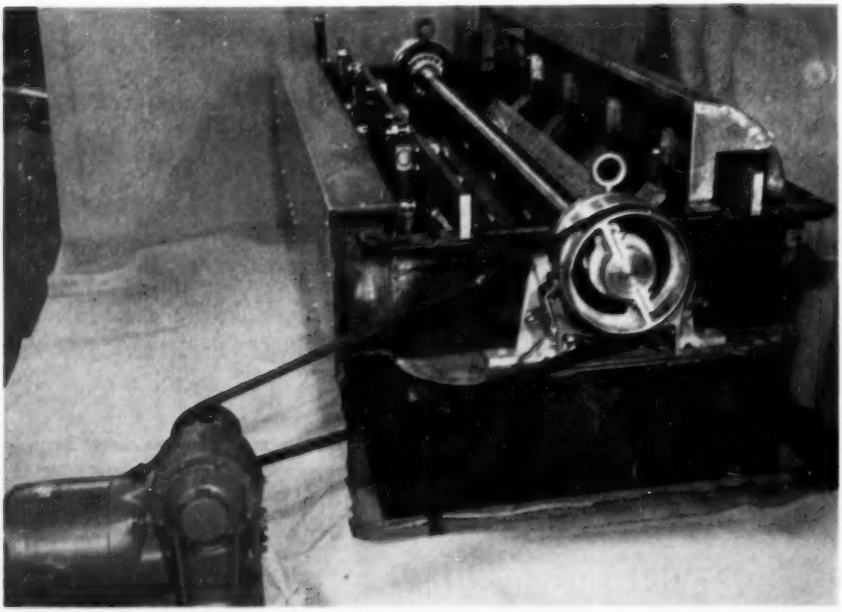
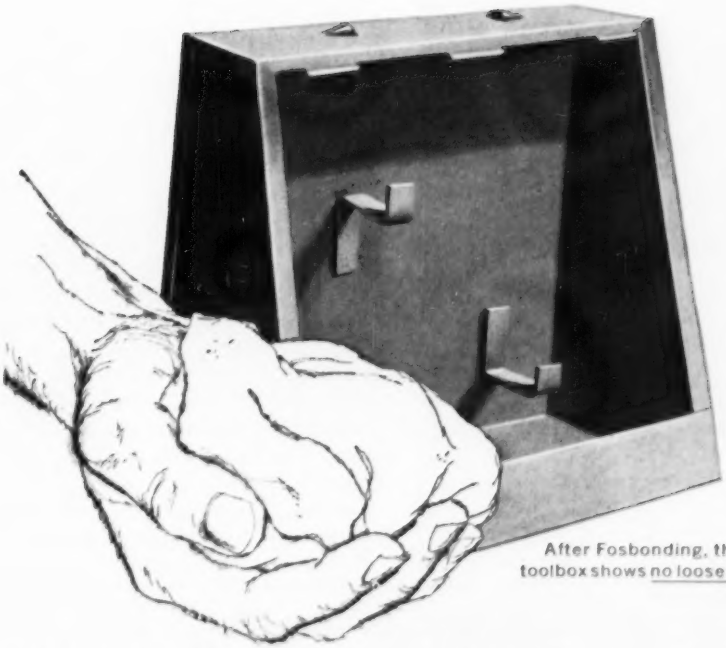


Fig. 1—A horizontal-roll processing tank with a semi-circular lead coated copper anode cradle, copper anodes, complete motor drive and reducer, current collector fingers, current collector rings, bearings and bearing guides for copper plating large rotogravure cylinders.



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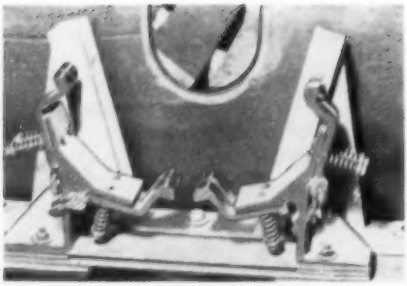

Fig. 2 — Close-up view of current collector fingers and bearing guides. Current collector fingers are under individual spring tension to ensure positive electrical contact. Each finger is rated to draw 200 amperes. The entire collector finger assembly draws 1600 amperes per assembly or a total of 3200 amperes.

cell depth; the entire paper surface may be colored to produce dark areas in the reproduction. This gives a continuous tone to the finished printing, without the dotted appearance of a screen or half-tone.

Ink is supplied to the rotating gravure cylinder both by a nozzle-type applicator and by an immersion bath. Gravure inks are necessarily quick-drying; hence, in order to prevent setting up in the gravure cylinder cells, nozzle-jet application of new ink is made immediately after the cylinder leaves the paper. The cylinder surface then rotates through a continuously circulated bath of ink, and is finally wiped clean by a honed steel doctor blade just before the cylinder contacts the incoming paper. This wiping action, of metal on metal, must be thorough in order to prevent blurred or dirty printing.

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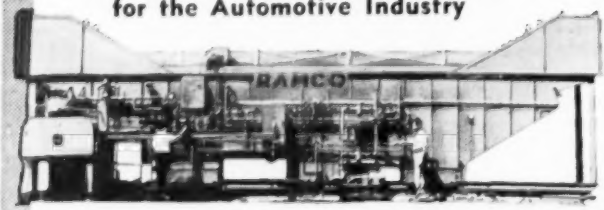

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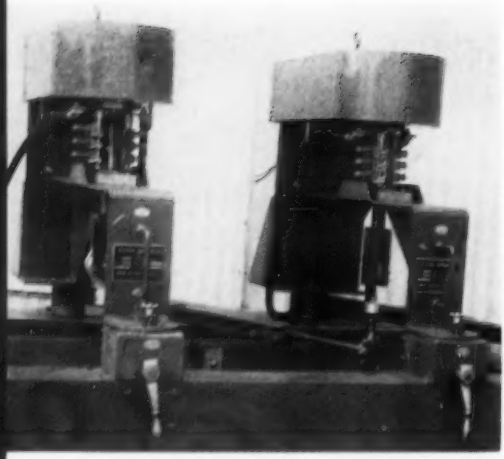

Fig. 3—A two-position vertical roll processing tank with motor drives and reducers, current collector fingers and holding mechanisms. This unit, though primarily designed for a heavy build-up of copper on textile printing rolls, is also used in copper plating gravure cylinders.

constructed of cast steel or cast iron, with a heavy outer surface of copper. Dimensions vary from one printing plant to another, but typical sizes are 76-inch length by 35- or 45-inch diameter. Standardization to one or two sizes within a plant results in appreciable economies in production.

The first steps in preparing a gravure cylinder for printing, by the Ballard Process, include polishing of the steel or iron surface to a high degree of smoothness, followed by a light coating of copper plated from a cyanide bath. After polishing, the cycle may include: alkali cleaner, rinse, acid pickle, rinse, cyanide dip, and cyanide copper plate.*

*See also, "Plating Rotogravure Printing Rolls," By Ezra A. Blount, PRODUCTS FINISHING, August, 1951, page 12.

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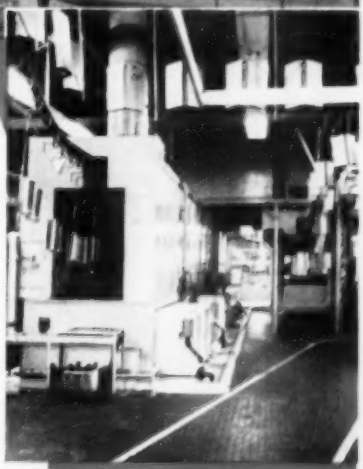

Top View: Spray booth adjoining an arrangement of over-hung finish baking ovens with feeder conveyor line.

Bottom View: Multi-stage washer and dry-off oven, conveyor supplies completely treated parts to spray booth.

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Spotlighting Finishing Progress

After the deposition of cyanide copper, the cylinder is rinsed thoroughly and then given a much heavier deposit of copper from an acid sulfate bath. It is next rinsed, and polished to a mirror-bright surface. This is the base coat of copper, which may remain in place through several different printing uses of the cylinder.

The heavy base coat of copper, with a high polish, is next given an immersion deposit of nickel from a solution of nickel ammonium sulfate. The nickel provides a barrier layer for the subsequent copper shell, permitting controlled stripping for re-use without interference with the electrodeposits previously laid down.

The cylinder then goes to a second acid copper plating operation, and the resulting surface is polished to a high finish. This finish must be free from any imperfections that would lower the quality of the printing job.

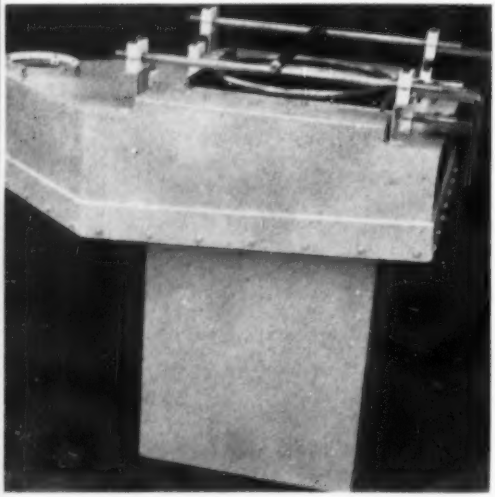


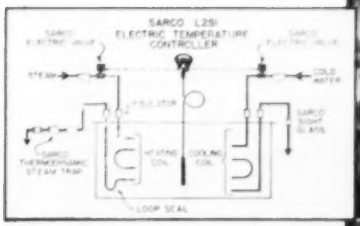
Fig. 4—A single position vertical roll processing tank with removable conforming anode ring for chromium plating gravure cylinders.

Special light-sensitive gelatin tissue, previously processed with the photograph or other art work which is to be duplicated, is then mounted on the polished copper cylinder. The copper is next etched through the gelatin, transferring the design to the cylinder surface. After a careful cleaning process, the printing surface is ready for use.

For particularly long printing runs, the wearing quality of a copper surface is not satisfactory. It is common practice to chromium plate the copper cylinder, prepared as described above, before its press run. A typical treatment for chromium plating, following all the steps outlined above, includes: polishing of the cylinder surface, soak cleaning, rinsing, acid dipping, rinsing, and chrome plating. Subsequent rinsing and cleaning operations are also necessary.

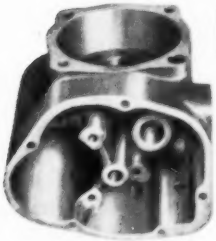
Various modifications of the process described are used in many plants. Frequently certain steps are omitted, to save processing costs and to reduce space requirements in the plant. The complete operation, including numerous rinses and rinse reclaims, has its advantages in quality of work, but is not justified for every type of job.

In the many processing steps needed for preparing rotogravure cylinders, the cylinder may be positioned either horizontally or vertically. The horizontal position is



Scientific plating department of Woodward Governor Co., Rockford, Ill., meets exacting government specifications. All plating and cleaning process tanks are equipped with Sarco Electric Indicating Temperature Controllers.

Tough precision plating problem solved by low-cost Temperature Control



0.0002" tolerance held by Woodward Governor in plating irregular and deeply recessed surfaces

PROBLEM—Look at the above case for an aircraft propeller governor. Its irregular shape and deep recesses present a tough plating problem.

Furthermore, Uncle Sam specified a top quality plate with a thickness tolerance of 0.0003 to 0.0005 inch... to assure mating of parts.

SOLUTION—Key to the solution of this precision plating problem is control of all the variables...and by far the most important is *bath temperature*. When it fluctuates, so does the plate quality... current density is affected...and, therefore, throwing power varies, causing uneven plate thickness.

That is why *all* Woodward Governor plating tanks are equipped with Sarco Electric Indicating Temperature Controllers, which automatically hold the plating solutions to ±½°F.

RESULTS—A top-quality deposit. Throwing power that assures uniform plating thickness on all surfaces...plane, irregular and recessed. Tolerance of 0.0002 inch...actually closer than government specifications. Minimum rejects.

Mr. Delbert L. Zeigler, plant manager of Woodward Governor, writes: "Sarco Electric Temperature Controls are doing an excellent job in every way."

Write for Handbook No. 6 or consult your plating supplies jobber. Sarco Company, Inc., Empire State Bldg., New York 1, N. Y.

Sarco Electric Temperature Controller

ADVANTAGES FOR ALL TYPES OF PLATING

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ELIMINATES DIFFICULTIES often caused by unreliable manual temperature control:

- Changes in current density
- Variations in plate thickness
- Variations in quality
- Dull finishes
- Breakdown of plating solutions
- Crystallization of salts
- Rejects

SARCO

improves product quality and output

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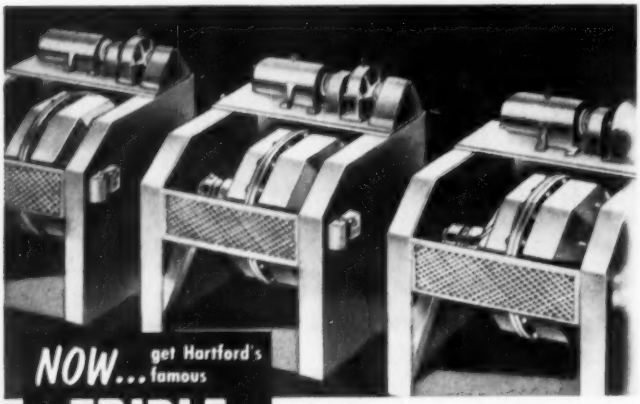
more common, but the textile printing industry often employs vertical processing units. In either position, the cylinder is completely submerged, and anodes are located to conform to the cylinder surface. Development of a partially submerged operation, with rotating horizontal cylinders, is progressing favorably at the present time.

Recent Developments

In a Hanson-Van Winkle-Munning Company release, J. H. Molitor, vice president and general manager of Art Color Printing Company, Dunellen, N. J., has described recent developments in the electroplating of rotogravure cylinders. These changes include: faster plating baths, smoother copper finishes, and improved cylinder handling methods.

Standardization of cylinders is beneficial in simplifying procedures for storage, handling, and production processing. At Art Color Printing Company, all cylinders are of the same length (76 inches), and only two diameters (35 inches and 45 inches) are used. This avoids any need for adaptors or adjustment in the handling mechanism. Plating instructions for each cylinder diameter are post-



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Compare these advantages! The Hartford fully enclosed Model 1956 is extremely compact...requires less floor space than most enclosed barrels. With Hartford the power unit is on top, where it belongs for long life, cleanliness and ease of maintenance. Barrel is mounted on rugged "A" frame for maximum strength. Streamlined steel enclosure confines splash and contributes to safe operation. Pivoted front guard opens to permit quick, easy loading and unloading . . . plus easy removal of barrel assembly. Standard power unit has four speed gear shift transmission. Literature and prices promptly furnished.

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International-504 is a blend of specially compounded detergents, wetting agents, high-solvency-power naphthas and solvents that literally dissolves dirt. When left on the work after cleaning, International-504 provides an excellent, temporary rustproofing film.

In terms of lower cleaning costs and more effective results, it will pay you to get the facts about International-504—the superior cold cleaner.

INTERNATIONAL CHEMICAL COMPANY
Specialists in Cleaners and Coolants for Industry
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ed, but are seldom referred to since there are only two sizes.

Handling of cylinders during processing has been simplified by properly engineered locations of storage areas and processing units. The plating tanks are arranged in line to simplify transfer of cylinders between tanks. Down-draft exhausts are used on the plating tanks, instead of the conventional overhead hoods, in order to use an overhead conveyor system for handling cylinders.

Automatic temperature controls are employed on all plating baths, thus providing better regulation of plating conditions and of the quality of electrodeposits.

Experimental developments in the plating solutions include the use of periodic reverse plating, and copper fluoborate in place of copper sulfate. The fluoborate solution produces a deposit in less time, and produces fine-grained deposits that are ductile and easily polished to the desired degree. The fluoborate solution requires accessory equipment including a filter and heat exchanger.

The rotogravure industry has adopted advanced techniques used in other phases of the electroplating industry, and is pioneering in the commercial development of some of the newer techniques.

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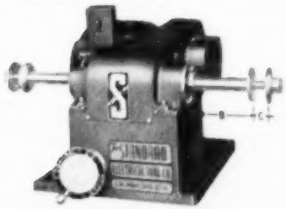

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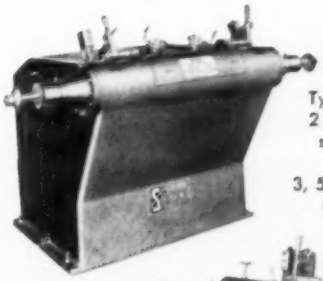

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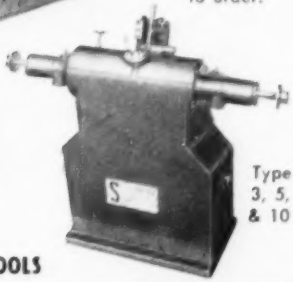

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Practical Applications of Modern Products

Applications for Cold Solvent Degreasing

By BERNARD BAER
Octagon Process, Inc.

COLD DEGREASING SOLVENTS are not new to industry, but recent advances in formulation have made them more effective for cleaning and safer to use. The properly formulated cold degreasing solvents now on the market do not build up toxic fume concentrations in the air. They evaporate rapidly from the parts being processed, leaving no oily film to interfere with proper paint adhesion. Their high flash points present less fire hazard. One such solvent is Klearall 95, manufactured by Octagon Process, Inc., Staten Island, New York.

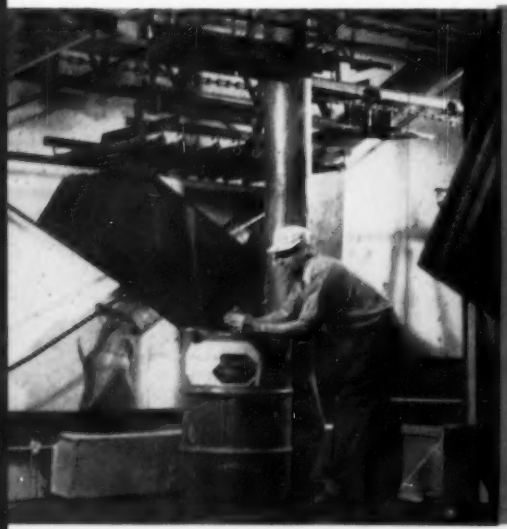

Fig. 1—Steel cabinet traveling on a conveyor rack into tank containing degreasing solvent.

Fig. 2—Steel panels being racked in preparation for degreasing by cold solvent process.

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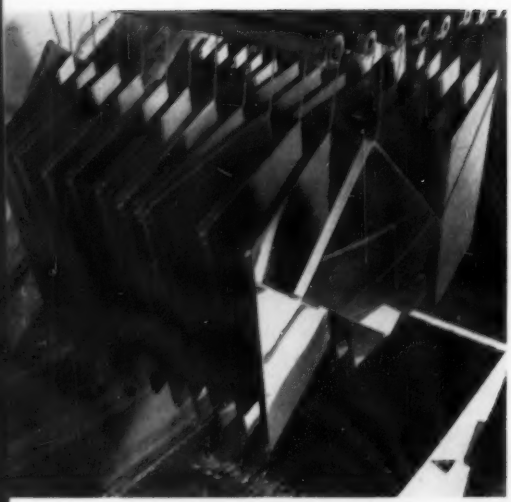


Fig. 3—Steel cabinet shelves emerging from immersion in Klearall. Fluid drains back into tank, leaving the metal clean and ready for finishing. (Photographs courtesy Octagon Process, Incorporated, Staten Island, N. Y.)

Cold degreasing solvents may be used in any metal tank. Time between clean-outs can sometimes be as long as three or four months. A properly formulated cold degreasing solvent will yield about 60 per cent recovery upon distillation for reclamation.

Since no heat is used in this process, the cleaning tank is always ready for use. After cleaning, parts may be racked immediately for painting without waiting for them to cool.

Cold degreasing solvents are particularly advantageous in cleaning large or bulky parts which are difficult to handle in a tank. Such parts may be cleaned by spraying or wiping with one of these solvents.

Klearall 95 cold degreasing solvent does not corrode or etch metals. No solvent or water rinse is necessary.

Among the products now being degreased with Klearall 95 are: gages, tools, tubes, pipes, sheet metal parts, wire, kitchen cabinets, playground equipment, metal furniture, metal chairs, antennas, radio parts, steel shelving, lighting fixtures, doors, channels, fans, hardware, metal awnings, wheelbarrows, motors, armatures and utility bins.

For more data circle 1 on Reader Service Card

★ ★ ★

Electrostatic Painting Improves Card Table Finishes

From an interview with:
A. M. CLAMAGE,
Industrial Engineer, Shwayder Brothers, Inc., Detroit.

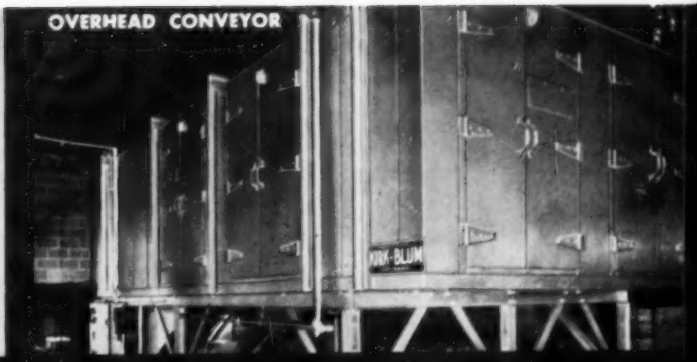
PLANTS OF SHWAYDER BROS., INC., in Detroit and Pittsburgh produce a popular line of card tables and chairs under the trade name "Samsonite," including hundreds of thousands of folding chairs and tables (Fig. 1) each year for institutional use.

Shwayder continually endeavors to improve production methods.

To page 82→

Fig. 4—Typical of the "Samsonite" folding furniture produced by Shwayder Bros., Inc., Detroit, are these chairs and card table.

ELT CONVEYOR



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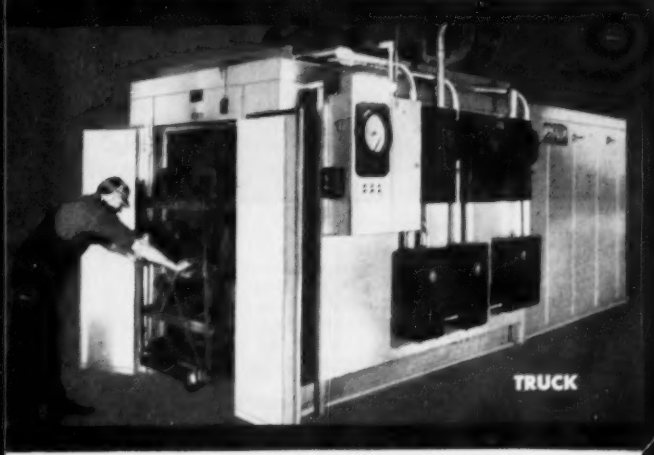

TRUCK

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Standard Glidden room air ▶ conditioner finish (left) withstood severe 400-hour salt spray test while competitive conditioner finish shows extreme pitting and eroding.

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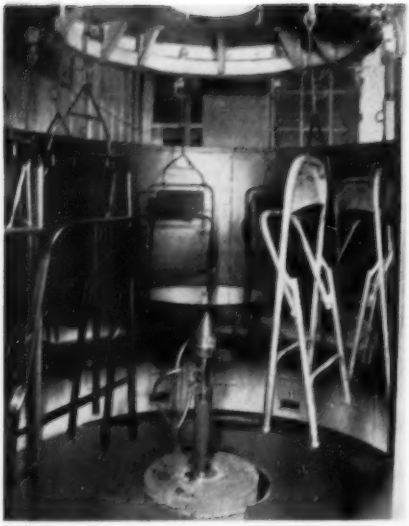

Fig. 2—These folding chair frames are being painted with the Ransburg No. 2 Process.

Quality of the company's finishing process was improved in the Shwayder Pittsburgh plant by installing the Ransburg No. 1 Electrostatic Spray Process. The Detroit plant was quick to follow suit with No. 1 equipment.

In 1955, when Ransburg No. 2 Reciprocating Disc equipment replaced the No. 1 Process, quality was further improved and higher standards established. Rejects from the No. 2 line were often better than acceptable quality of the old No. 1 line. Much of the quality improvement was apparent in the more uniform film thickness produced by the reciprocating disc.

Three standard colors—brown, grey and black—are used on chairs and tables. Additional colors are used on smaller items such as the Samsonite tray table. Paints on all Samsonite products are special formulations furnished by E. I. du Pont de Nemours & Co., Inc.

In the Detroit plant, tables and chairs are produced in three basic styles; and the various styles are run

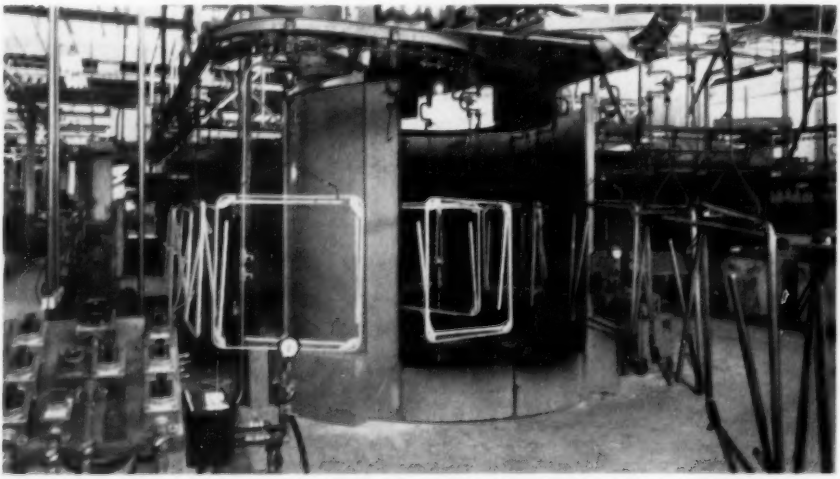

Fig. 3—"Samsonite" card table frames are carried on 48-inch centers as they enter the electro-spray paint area. Control panel for the Ransburg No. 2 Process Reciprocating Disc Atomizer is shown at lower left. (Photographs courtesy Ransburg Electro-Coating Corp.)

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intermittently at the same settings of the painting equipment.

A six-stage phosphatizing process precedes the painting operation. Work to be painted is hung on an overhead monorail conveyor approximately 200 feet in length. The conveyor operates at an average speed of 22 feet per minute and fixtures are spaced at 24-inch centers. With the No. 1 Process, the line was operated at 18 feet per minute. Production was increased from 9 to 11 chairs per minute when the Ransburg No. 2 Reciprocating Disc equipment replaced the No. 1 units.

On the chair line in Detroit, there are two electrostatic spray paint stations. At the first station, the conveyor makes a loop around the first Ransburg No. 2 Process Disc Atomizer (Fig. 2). Paint is pumped from the central distribution system to the center of the disc and rotation spreads the material evenly to the atomizing edge. High d.c. voltage is imposed on the disc, establishing an electrostatic field between the disc and the electrically grounded parts on the conveyor. The resulting electrostatic field atomizes the paint into a fine spray that is attracted to the surrounding parts. Multiple strokes of the reciprocating disc permit application of a uniform coating from top to bottom of the work. As the work comes out of the first station, an indexer on the conveyor turns the chairs for

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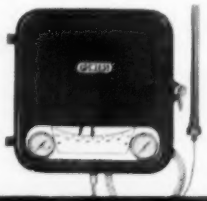

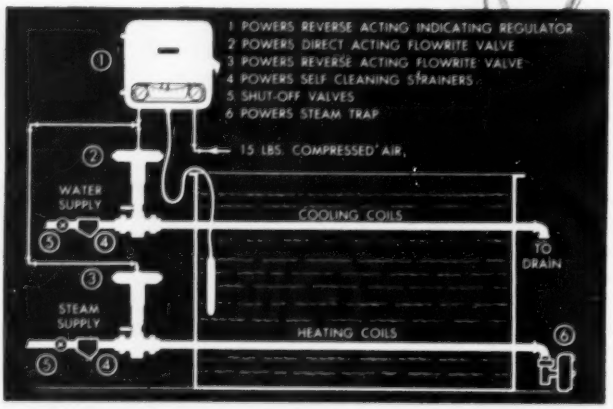

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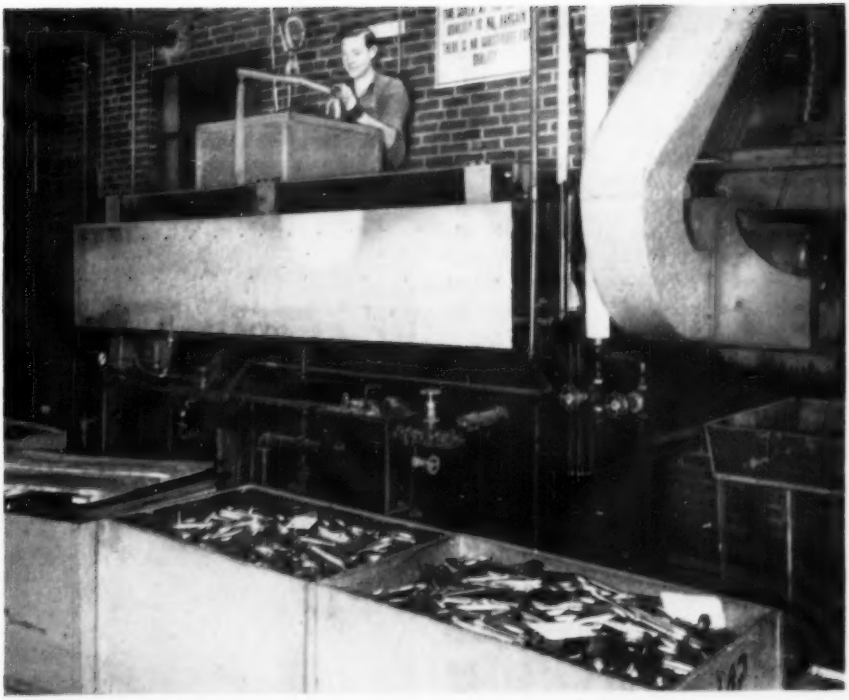

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painting on the opposite side in the second electro-spray station, identical to the first station.

From the paint area, chairs go into an infra-red oven for a 10-minute bake at 350 deg. F. Four to seven thousand chairs are always banked on conveyors ahead of packaging.

Card table frames are handled on another line which was recently converted for using Ransburg No. 2 Process Reciprocating Disc Atomizers in two stations on the order of the chair line setup. Tables are hung at 48-inch centers (Fig. 3). On the first day of operation, production was 1,300 units; and rejects were cut to 2 per cent.

Less floor space is required for the present finishing setup, and maintenance has been cut. The shields around the electrostatic spray area need be cleaned only about every six weeks.

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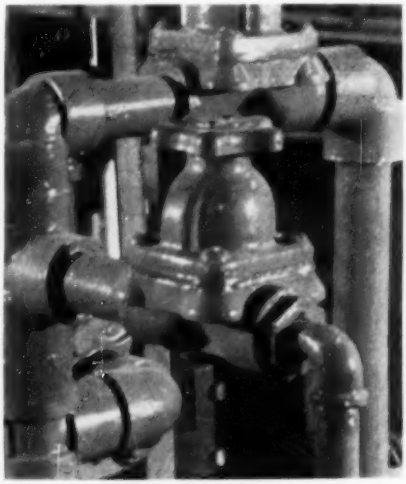
Plastic Pipe Successfully Handles Plating Solution

THE PROBLEM of circulating nickel plating solutions through four nickel plating tanks at the Bloomfield, N. J., plant of the Lamp Division, Westinghouse Electric Corporation, has been solved by installation of corrosion-resistant rigid polyvinyl chloride pipe. This pipe is used to carry nickel plating solutions to a heat exchanger and back to the plating tanks where lamp lead-in wire and supports are plated. The Alpha No. 101 Normal Impact Rigid PVC Pipe, installed by Alpha Plastics, Inc., West Orange, N. J., successfully carries the low pH plating solution at a temperature of 150 deg. F., at the rate of 200 gallons per hour. Plant engineers have found that best performance and durability is obtained by firm support of all the rigid polyvinyl chloride pipe and fittings.



Closeup of polyvinyl chloride pipe and fittings carrying corrosive plating solution. (Photo courtesy Alpha Plastics, Inc., West Orange, N. J.)

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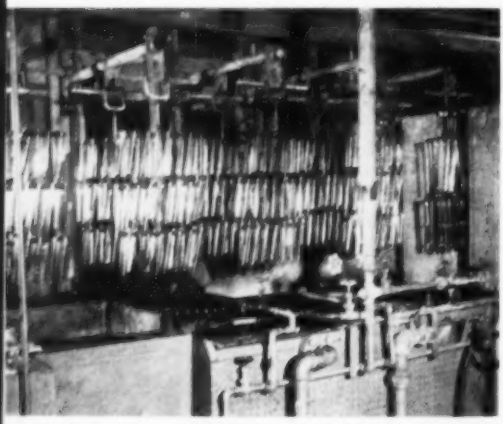
Producing Nickel Plate with a Snap

CONVERSION TO BRIGHT NICKEL plating has proved to be a wise move for the S. E. & M. Vernon Company, Elizabeth, N. J., a large producer of looseleaf folders and binders.

Besides turning out a more attractive product, which is popular with



Looseleaf binder rings are shown coming out of a nickel plating bath. The H-VW-M full automatic elevator type conveyor is pictured in the up-position. When the transfer is completed, the racks in the center of the picture will be situated directly above the rinsing tanks. The conveyor carrier arms will then lower the work into the baths. Racks on the far right are shown going through a dryer. Carrier arms remain in an up position during this operation. (Photo courtesy Hanson-Van Winkle-Munning Company, Matawan, N. J.)

dealers and consumers, the process has also effected production economies and has increased the rate of production. The process, a product of Hanson-Van Winkle-Munning Co., Matawan, N. J., also offers greater stability and lower operating temperatures.

For more data circle **4** on Reader Service Card

Plastic Dispersion Used to Protect Metals from Corrosives, High Temperatures

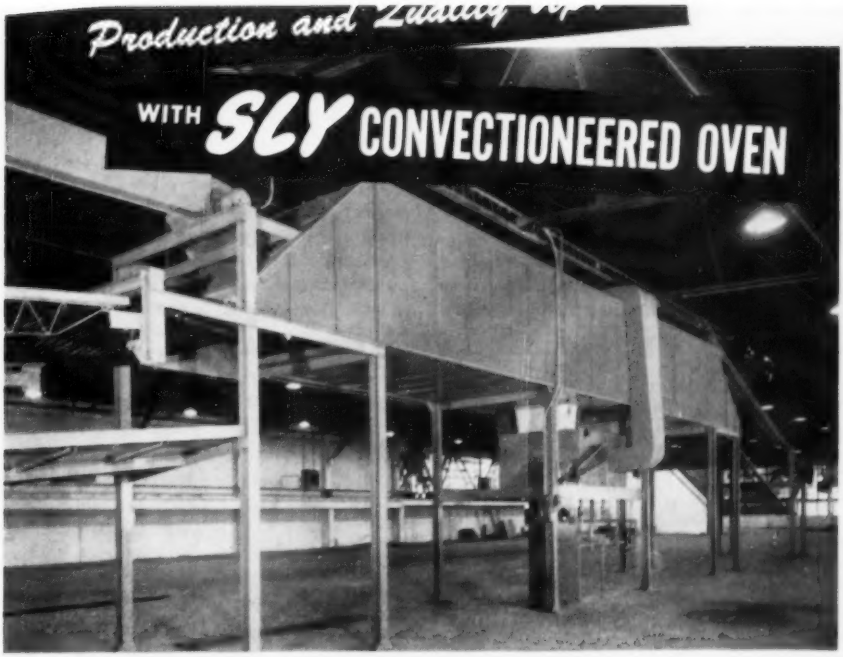
FOR EQUIPMENT operating under high temperature and corrosive service conditions, surface protection is absolutely necessary in the constant effort to decrease down-time and keep equipment from deteriorating.

Protection for such equipment is being accomplished with Kel-F Plastic Dispersions* — chemically inert, high temperature-resistant materials which may be applied by spraying, dipping or spreading to a variety of metallic and non-metallic surfaces.

These dispersions, produced by The M. W. Kellogg Co., a subsidiary of Pullman Inc., are characterized in appearance by a high gloss. They will neither contaminate the products with which they come in contact nor corrode the surfaces they are protecting. Their flexibility frequently permits the coating of metals in the flat prior to forming. The application of Kel-F Dispersions results in a coating with the properties of the original plastic: resistance to temperatures approaching 400 deg. F. and low temperature flexibility; resistance to chemicals, including alkalies, mineral acids, strong oxidizing acids, and solvents; low permeability to moisture, organic and inorganic liquids and vapors; high abrasion resistance and tensile strength; low cold flow and high impact resistance; high dielectric strength and electrical resistivity; and non-toxic and non-sticking characteristics.

Kel-F Dispersions consist of finely divided particles, 1-20 microns, of Kel-F Plastic suspended in volatile organic liquids, similar to those employed in

*Reg. Trade Name, The M. W. Kellogg Co.



With an increase in business, the Interior Steel Equipment Co. has augmented their paint baking facilities. In doing this they have achieved economies in handling of work while maintaining and even enhancing the quality of their products.

They installed a Sly Convectioneered Oven, 45′ long, 9′ 6″ wide, 6′ 9″ high with semi "A" type sheet metal hoods at the exit and entrance ends to form an efficient heat seal. Beneath the oven is a self-contained 2,500,000 BTU per hour direct gas-fired heating unit.

As aids in achieving excellent finishes on the products are: (1) efficient air distribution over the work (2) temperature uniformity in the baking zone (3) correct exhaust conditions to maintain proper oven atmosphere, and (4) a low overall temperature gradient between supply and recirculation temperatures.

This installation is typical of the careful engineering that goes with all Sly Industrial Ovens. *May we discuss your requirements with you?*

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normal paint and lacquer systems. The organic media is selected for proper viscosity and volatility characteristics to permit the spray application of non-sagging wet films which fuse to a film thickness of approximately 2-2.5 mils.

Two major types of these dispersions are available: a low-viscosity dispersion supplied at normal spray viscosity (Zahn G-1 viscosity of 32-34 seconds), and a high viscosity dispersion for spread,, flow and dip coating. Low molecular weight waxes are included in the spray formulation, which can be thinned, if required, with xylene. The addition of wax contributes to the cohesion and adhesion of the air-dried particles to supporting surfaces. It also promotes a more rapid fusion of the particles into a continuous film. The major portion of the wax volatilizes during baking. Both types are supplied at 40 per cent solids.

A third type of dispersion consists of 1-20 micron size particles, and is supplied at 35 per cent solids.

The coating thickness obtainable with Kel-F Dispersions is dependent on the application. For corrosion control, usual practice recommends a minimum thickness of 10 mils built up in four to five successive coats. For extremely severe corrosion problems, however, coatings are occasionally built up in thicknesses of 15-20 mils.

Most metals including steel, stainless steel, aluminum, nickel, silver, cadmium, and lead-tin alloy plated copper

Meet the abbot

Here's a little man you'll surely want to know.

Philosopher and physicist, mathematician and mechanic, designer and doodler, dreamer and detective — these are a few of the intriguing facets which make up the engaging personality of *the abbot*.

Space doesn't permit us to tell you all about him here. Suffice it to say he's a dedicated soul (he professes no specific creed or faith) who has devoted his life to a study of "Barrel Finishing — with Steel Balls and Shapes" . . . particularly our own tumbling barrels and tumbling materials.

We think you'll want to read the fascinating case histories which he will present in this space in the months ahead, but first, we'd like to send you a more detailed explanation of his background and how he came to select his favorite study subject. So, just drop us a line and we'll send you a formal introduction to . . . *the abbot*.

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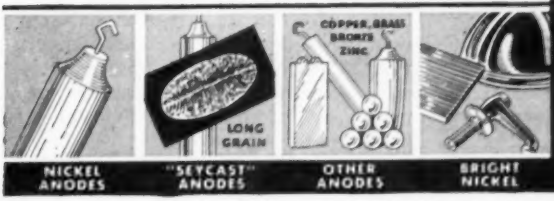

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can be coated satisfactorily with dispersions based on Kel-F Plastic. However, copper and non-plated copper-bearing alloys oxidize excessively at high fusion temperatures and form a brittle oxide which is non-adherent to the base metal. And aluminum alloys such as those used as structural members in aircraft lose structural strength at temperatures required to fuse the polymer coating.

A few current uses of Kel-F Dispersions are as coatings for trailer tanks, tankcars, storage tanks, pipe lines, pumps, mixers, valves, flowmeters, reactors, shipping containers, waste neutralizers, agitators, calendering rolls, forming dies, guide rolls, mattress molds, ribbon blenders, cone blenders, hoppers, casting molds, miniaturized stators and miniaturized relays.

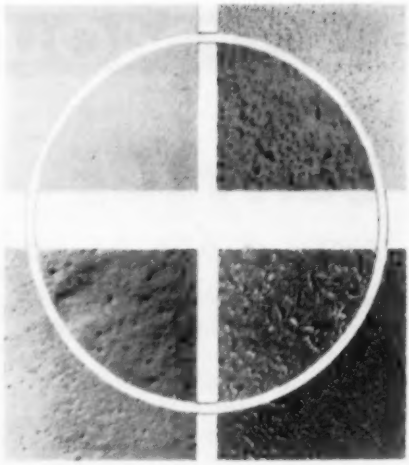

Fig. 1—Sprayed coatings of Kel-F Dispersions are dependent upon application technique. Upper left: properly applied, smooth air dried coating, applied using air pressure of 15-20 p.s.i. Upper right: rough, air dried coating applied at 35 p.s.i. Lower left: cratered, air dried coating caused by applying too wet. Lower right: baked, mud cracked coating caused by too heavy an intermediate coat.

Application

The baking-type Kel-F Dispersions can be applied by spray, dip, flow, or spread coating.

The basic procedures in application incorporate conventional surface pretreatment, as do most other finishing systems. Surfaces to be coated are first degreased or pre-baked to remove organic contaminants. They are then abrasive blasted and cleaned.

Spray Coating

Complex shapes have been spray-coated successfully with Kel-F Dispersions, and spray patterns developed by The M. W. Kellogg Company, in cooperation with coating applicators, provide means of applying individual uniform coats, approximately 2-3 mils thick, in an assembly line fashion.

Proper technique is illustrated by the

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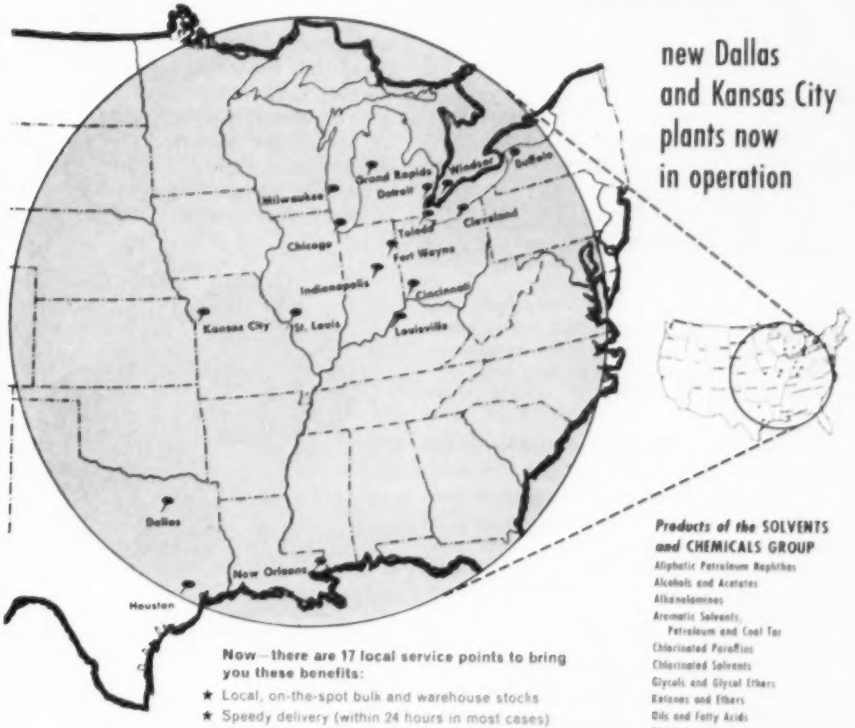

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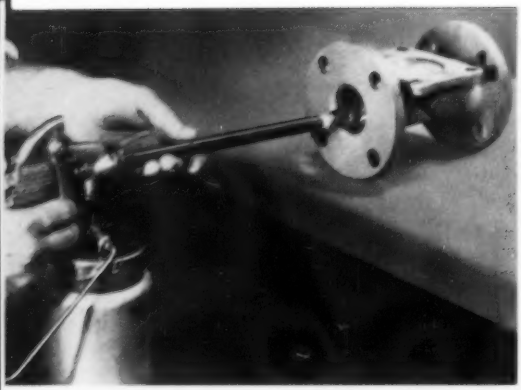

Fig. 2—Coating a 2 inch valve body with plastic dispersion, using a 360 degree extension gun. Material was sprayed as gun was withdrawn rapidly from passage. Each withdrawal was considered a single pass.

procedure employed for coating a flat panel. A syphon gun is regulated at 15-20 p.s.i. air pressure to provide a four inch fan. The gun is normally held at a distance of about six inches and moved at such a speed that a six-pass pattern, using alternate vertical and horizontal passes, will deposit a smooth coating of uniform thickness of about 2.5 mils (after baking). If the coating appears too wet after two or three passes, it should be dried to a dull grey with a gentle stream of air before completing the remaining passes. Coatings applied too wet tend to crater (Fig. 1). The coating should not be air dried to a dead white between passes because this promotes blistering during baking.

If too heavy an intermediate coat is deposited, this coat will mud crack during baking. The coat applied previously to this one, however, is not affected. A film that has mud cracked is scraped with a knife to remove that part of the coating not adhering tightly to the metal or to the preceding coat before the next coat is applied.

Dip and Flow Coating

Objects to be dip or flow coated with Kel-F Dispersions should be designed with a provision for proper drainage. This will prevent the deposition of an excessive amount of material on a flat recess, for example. They should be withdrawn from a dipping tank at a speed that will prevent the coating from sagging. The withdrawal rate of a $\frac{3}{8}$-inch diameter rod, for example, is about 12 inches per minute. The particular dispersion designed for flow coating is especially adaptable to the flow coating of small diameter pipe interiors.

Fig. 3—Valve body finished with a Kel-F dispersion after baking. Five coats were applied to this valve prior to baking. (Photos courtesy M. W. Kellogg Co., Subsidiary of Pullman, Inc., Jersey City, New Jersey.)

Pressure tanks provided with an air motor agitator and normally used for spraying may also be used as a holding tank for these dispersions. The hose normally connected to a spray gun may be connected to the pipe through a suitable nipple and flange assembly. By pressurizing the tank, the dispersion is forced up into the pipe stationed in a vertical position. This forces air out of the pipe through the open end at the top. As the tank is depressurized slowly, the dispersion is drained from the pipe back into the pressure tank. In this closed system, thinning the dispersion with acetone provides quick set and prevents sagging of the coating on the pipe's interior wall.

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Baking Techniques

Two fusion temperatures are recommended to bake Kel-F Dispersion films: 480 deg. F. or 520 deg. F. Adequately fused, high molecular weight coatings are produced by total baking operations of 18 hours and 10 hours at 480 deg. F. or 520 deg. F., respectively. The total baking operation includes the intermediate bakes and the final bake. Intermediate bakes for coatings on metals should run from one-half hour to one hour at 480 deg. F. and one-quarter hour to one-half hour at 520 deg. F. These are actual substrate temperatures, measured by thermocouples or judged fairly accurately by the transparency of the coating.

The air dried coating is white and opaque. It becomes clear and transparent after the substrate and coating temperatures reach 412 deg. F., the melting temperature. This clarity and transparency may be considered as the beginning of the intermediate bake. Time of the final bake at 480 deg. F. or 520 deg. F. is the difference between 18 hours or 10 hours, respectively, and the total time for the intermediate bakes.

Electrically heated or gas-fired ovens of the forced draft recirculating type are both satisfactory for fusing the coatings. To promote good temperature uniformity, however, and prevent small temperature fluctuation, temperature variation within the oven should not be more than plus or minus 50 deg. F. The temperature fluctuation regulated by the oven controller should not exceed plus or minus 10 deg. F. Ovens should be profiled using thermocouples and a potentiometer and modified if necessary to conform with these specifications. Compliance with these recommendations will produce high molecular weight, impermeable coatings.

Quenching Techniques

Many of the physical and chemical properties of these plastic coatings depend on the type and extent of crystal-

Filter your Solutions!

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Self-priming Model LSIN-10 . . . Cap. 100 gal/hr. H.T. Lucite Filter Assembly. Stainless pump . . . totally enclosed Motor . . . portable . . . Wt. 60 lbs. 14"x16"x16" high.

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LSI-10	100 gal/hr	12"x16"x16"	40 lbs.
ASI-300	300 gal/hr	2'x2'x3'	125 lbs.
ASI-600	600 gal/hr	2'x2'x3'	150 lbs.
RLS-1200	1800 gal/hr	2'x3'x3'	300 lbs.

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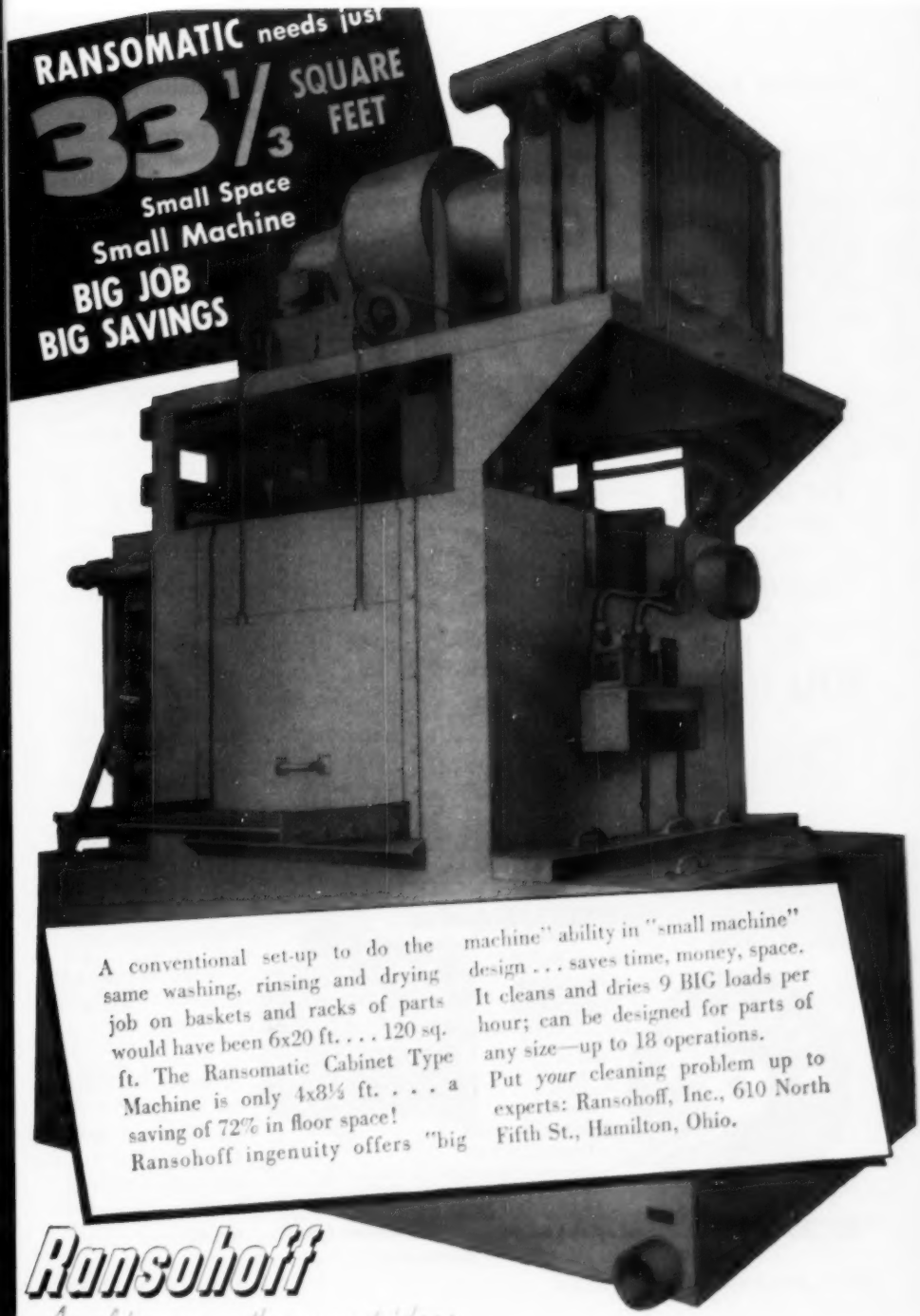

A conventional set-up to do the same washing, rinsing and drying job on baskets and racks of parts would have been 6x20 ft. . . . 120 sq. ft. The Ransomatic Cabinet Type Machine is only 4x8⅓ ft. . . . a saving of 72% in floor space!

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linity, which in turn is controlled by the way in which the coatings are quenched after final bake. Relatively, "quick-quenching" produces an amorphous coating and "slow-cooling" or "heat treating" produces a crystalline film. The quenched coating is opalescent blue to opaque white, depending upon the degree of crystallinity, with higher tensile strength, lower elongation and less flexibility. Corrosion tests indicate the quenched coating is less permeable because it is more extensible and less strained on irregular shaped objects.

Quenching is accomplished by removing the object from the oven and quickly immersing it in water before the temperature of the coating falls below 412 deg. F. Larger objects which are impossible to immerse in water may be sprayed or flooded with water — a gentle stream if played directly on the coating.

Intermediate coats may be quenched or slow-cooled. If quenched, the coating should be cleaned and dried with acetone or alcohol. The method of cooling the intermediate coats has no bearing on the final physical state of the coating.

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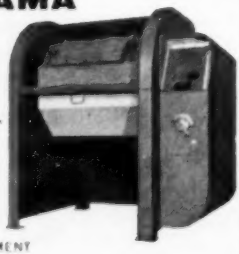

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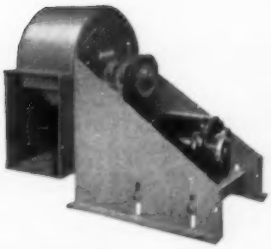

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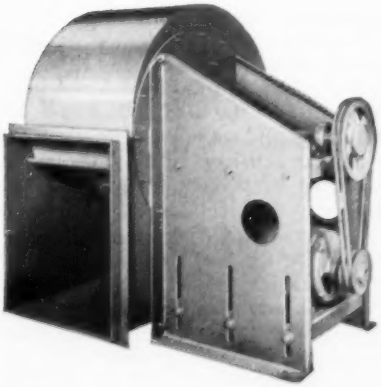

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› Finishing

V-Belt Powered Barrel Plating Equipment

A barrel plating "line" introduced by the G. S. Equipment Co., 5321 St. Clair, Cleveland 3, Ohio, incorporates V-belt suspension drive for rotating cylinders. Neoprene V-belts support and furnish rotational power to each cylinder, thus allowing complete cylinder immersion in corrosive plating solutions without damage to the line's drive mechanism.

The superstructure design of this equipment uses two 12-inch-long inverted V-block cathode contacts, providing increased contact area. A guide channel directs the superstructure into position on the tank, seating the inverted V-blocks on round cathode rods attached to the tank rim.

G. S. Equipment barrel plating line: neoprene V-belts to rotate plastic plating cylinders.

Danglers are directed at a downward angle through floating "H-T Sincolite" plastic hubs. Danglers will not "ride up" on the load, it is stated. Dismantling and assembly are simplified by use of self-locking U-plates of plastic fitted over the cylinder hubs. The assembly is unlocked by sliding out the U-plates.

Cylinders are of clear plastic heavy-ribbed, fusion welded construction, and can be used in any solution temperature up to 200 deg. F. All parts of each barrel are interchangeable.

At the front end of the line is a semi-automatic barrel loader. The receiving end of the chute is flush with floor level for easy loading, and tilts automatically as it is hoist-lifted, discharging its full load into the rack-supported cylinder.

At the finish-end are centrifugal driers. These are dual units fed by a dividing chute in which the discharged cylinder load is separated and fed into the two metal drying baskets, which then spin in preheated units.

For more data circle **6** on Reader Service Card

Lacquer Thinner

The film thickness of sprayed lacquer deposited on work can be increased appreciably with Hi-Sol Thinner, according to Potter Paint Co., Inc., Cortland 2, New York.

Application of the heavier coat is accomplished by a blend of solvents which causes rapid increase in viscosity of the lacquer from spray gun to the surface sprayed. Because of this characteristic, sagging is reduced.

The thinner also imparts improved flow, gloss and blush resistance to lacquers with which it is used.

For more data circle **7** on Reader Service Card

★ ★ ★

Humidity Cabinet

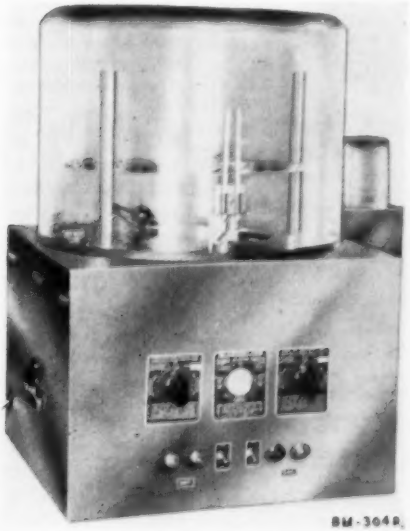
Blue M Electric Co., 138th and Chatham St., Blue Island, Ill., has announced a mechanical convection temperature controlled relative humidity cabinet, known as "Vapor-Temp." It features easy accessibility and good visibility, hermetically sealed lead-in terminals, and adjustable air flow. Well suited to both long and short term tests, including those required by military specifications, the equipment automatically controls relative humidity from 20 per cent to near saturation at any point, depending upon dry bulb temperature. The wet bulb is accurate to within ±2 per cent; dry bulb accuracy is possible within ±1 deg. F. from ambient to 158 deg. F.

For more data circle **8** on Reader Service Card

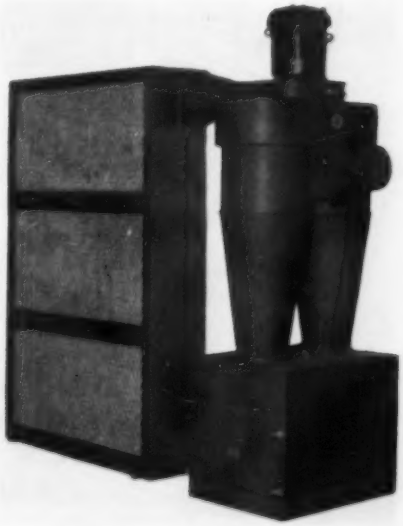
★ ★ ★

Cyclone-Type Dust Collector

Effective filtration through six "throw-away" filters is one of several features of the after-filtering mechanism designed for the Torit Model 219 FM-A cyclone-type dust collector by Torit Mfg. Co., Dept. KP, 287 Walnut St., St. Paul 2, Minn., builder of individual dust collecting machines.



Vapor-Temp Relative Humidity Test Cabinet



Torit 219 FM-A Cyclone-Type Dust Collector

Used to collect dust, lint, chips, powders and fumes in industrial plants, the 219 FM-A recirculates filtered air back into the room, thus preventing heat loss during cold weather. Its 5 h.p., 3,450 r.p.m. motor pulls 2,100 cu. ft. of air per minute through the 8 inch inlet at a static pressure of 3.0 inch (water) and an air speed of a mile a minute.
For more data circle **9** on Reader Service Card

Emulsion Cleaner

Kelite Ke-Sonic, an emulsion cleaner for the removal of oily soil and greases, has been announced by the Kelite Corp., 1250 N. Main Street, Los Angeles 12, Calif. Ke-Sonic is used for cleaning of aircraft, ship bunkers, trucks, automotive, railroad equipment, and heavy machinery, and is exceptionally desirable for marine use because removed soil is held in emulsion even when mixed with sea water.

One form, known as Ke-Sonic-C, is employed by diluting with kerosene, diesel fuel or No. 2 fuel oil. The soiled parts are sprayed, brushed, wiped or immersed in the solution. Ke-Sonic-C is corrosion safe on all structural metals, and will clean metal to provide a no-water break rinse, it is stated.

Ke-Sonic may be diluted with up to 20 parts of water and used in industrial pressure washing machines for cleaning metal parts. Both Ke-Sonic and Ke-Sonic-C are fire safe—exhibit a Cleveland open cup flash point of 180 deg. F. and a Cleveland open cup fire point of 220 deg. Fahrenheit.
For more data circle **10** on Reader Service Card

YOUR DEALER
NAZ-DAR
800 SERIES
WEATHER-PROOF
SILK SCREEN ENAMEL
SILK SCREEN PROCESS COLORS
EXTENDS YOUR PRINTED AREA WITH UNIFORMLY HIGH OPACITY DURING AN ENTIRE RUN
TV SETS — NAME PLATES
TOYS — DIALS
ASH TRAYS — CHASSIS
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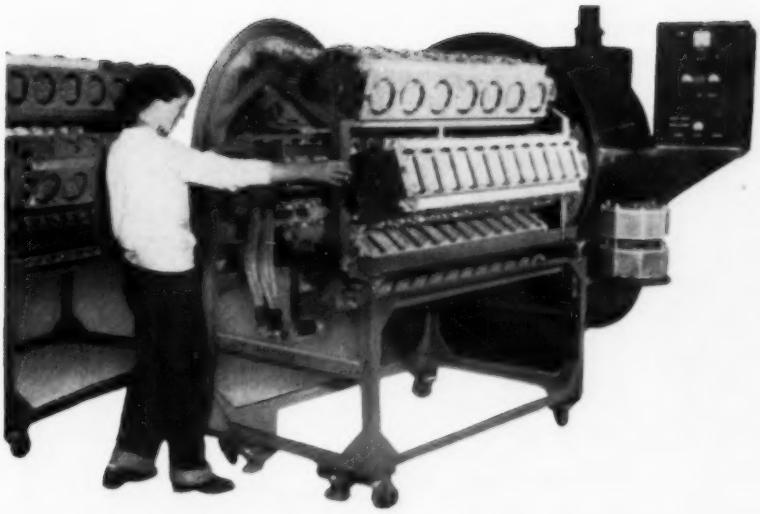
NAZ-DAR WEATHERPROOF SILK SCREEN ENAMEL
INKS • VARNISHES • LACQUERS • SILKS • SCREEN PLATES • SQUEEGEES • FILMS
For more data circle **178** on Reader Service Card



How to cut finishing costs

The finishing of plastic or metal pieces can be very profitable, *if you keep your process costs low.*

Vacuum metallizing with one of these *CVC* 48-inch vacuum coaters can cut costs to as little as a few cents per thousand. Here's why:

Large capacity: You can turn out thousands of pieces with this coater in a normal workday. High-capacity fixtures carry work for single-side or all-surface metallizing.

Versatility: Using lacquers and inexpensive aluminum, you can obtain literally hundreds of colored finishes.

Fast cycling: With *CVC*'s 48" coater you can run two, three, or even four cycles an hour, depending on the base material used.

Simple operation: After a few hours' instruction, your personnel can turn out flawless coatings with this machine. A single operator simply inserts racks of lacquered pieces into the chamber, closes the "door," and initiates the pumping cycle. When the chamber pressure drops to the desired level, he evaporates the aluminum, which condenses immediately on the pieces. No buffing or polishing operations are required to turn out pieces with a mirror-like finish.

We'll be glad to share our long experience in vacuum metallizing and associated lacquering operations to help you set up your own coating system. Write for illustrated literature on the 48-inch coater and other *CVC* production units.

These rich-looking clock faces are inexpensive plastic coated with aluminum under high vacuum. Various lacquers provide a wide range of colored finishes.

A CVC vacuum coater enhances the beauty of pieces like this radio face, and gives the molder extra profits from the operation performed after molding.

A 30" CVC vacuum coater turns out 550 of these amber-colored TV tuning knobs in one hour. You can metallize a wide variety of other sizes and shapes.

Consolidated Vacuum, Rochester 3, N. Y.

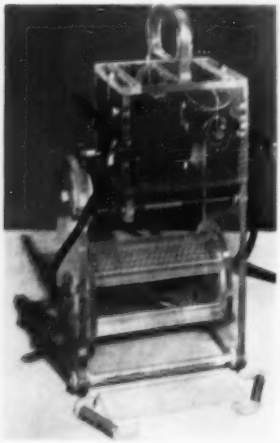
a division of CONSOLIDATED ELECTRODYNAMICS CORPORATION, *Pasadena, California*

Sales Offices: Albuquerque • Atlanta • Boston • Buffalo • Chicago • Dallas • Detroit • New York • Palo Alto • Pasadena • Philadelphia • Seattle • Washington, D. C.

For more data circle 179 on Reader Service Card

Small Barrel Platers

Two barrel units designed for electroplating small parts or small quantities of larger parts have been announced by Technic, Inc., Providence, R. I.



Technic Portable Plating Barrel

The Technic Model OH-42 is a dual barrel electroplating unit, and Model HP-4 is a portable plating barrel. Both are made of high temperature lucite, so that they can be used in any solution for electroplating precious metals, and will adapt readily to other types of electroplating.

Dual Barrel Model OH-42 is a complete barrel plating unit in itself, of one gallon capacity, with a 60 cycle single phase 110 volt motor attached. Dimensions of the lucite tank are 7 by 7 by 6 inches. The oblique barrel is an octagon measuring 2½ by 2½ inches, and the horizontal barrel is a hexagon measuring 4¼ by 2½ inches. Holes of standard size are 3/32-inch. A rod for tank plating is included.

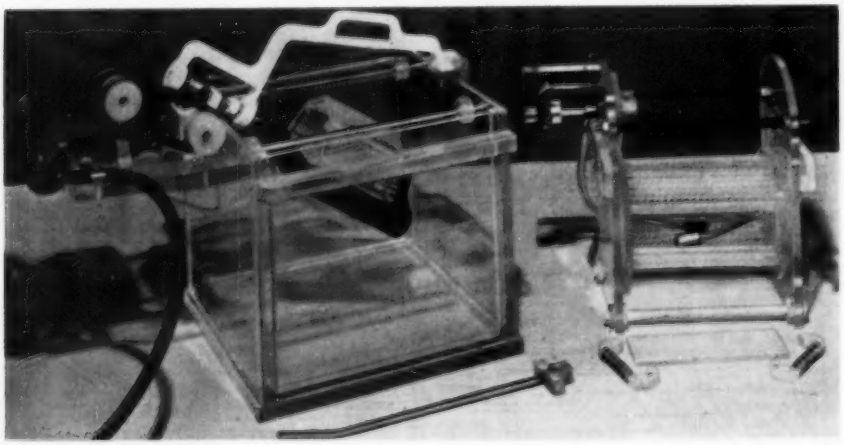
The Model HP-4 Portable Barrel is intended for use by immersion in any existing tank. Overall dimensions are 6 by 4¼ by 7¼ inches to the plating rods, the hexagonal barrel measuring 4¼ by 2½ inches. Standard holes are 1/16-inch. A 110 volt 60 cycle single phase motor is attached.

For more data circle 11 on Reader Service Card

★ ★ ★

Abrasive Wheel for Portable Grinder

Simonds Abrasive Co., Tacony & Fraley Sts., Philadelphia 37, Pa., has announced development of the Simex Red Wheel, a lightweight, rigid-type reinforced resinoid bonded abrasive wheel for use on portable disc type and



Model OH-42 Small Lot Dual Barrel Electroplating Unit. Oblique barrel is installed in tank. Horizontal barrel is shown (right). Both are constructed of clear plastic.

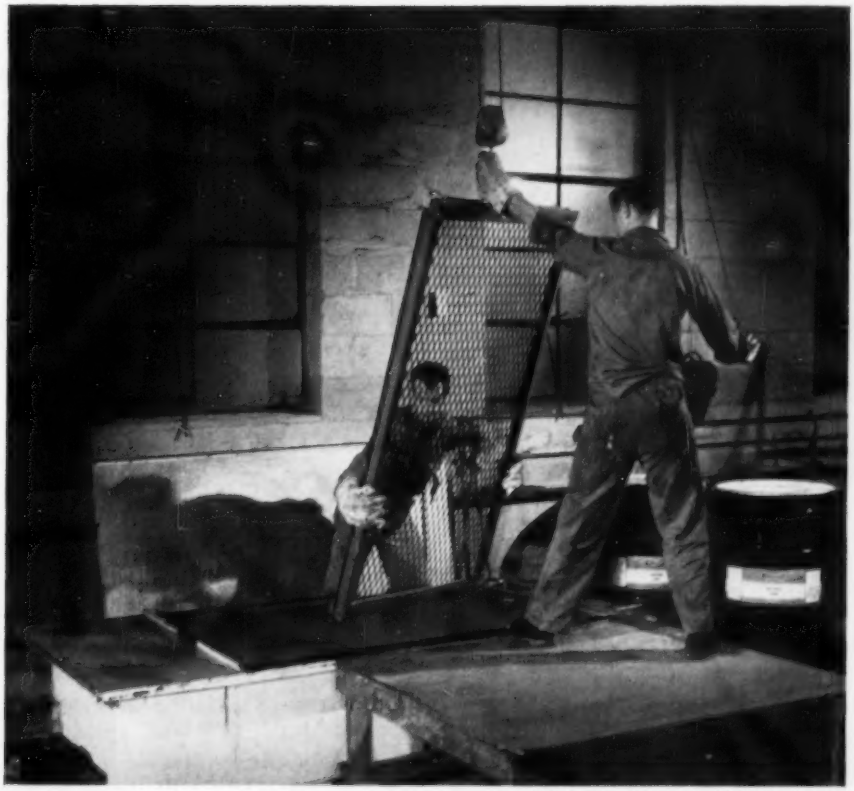


Photo courtesy Kaybar, Inc., Hazel Park, Michigan

what's going on here?

Unichrome Coating 218X, of course!

EVERY USER *knows* that in coatings for racks and screens, there's never any question of quality with Unichrome Coating 218X. This vinyl plastisol endures all plating and cleaning cycles, does not contaminate sensitive baths, survives long hard use without damage. Users know too, that through its extended service life and reduced maintenance, they're getting lowest costs.

If you don't want to apply it yourself, nearby, experienced, skillful specialists can apply Coating 218X for you. Ask us for names.

UNICHROME

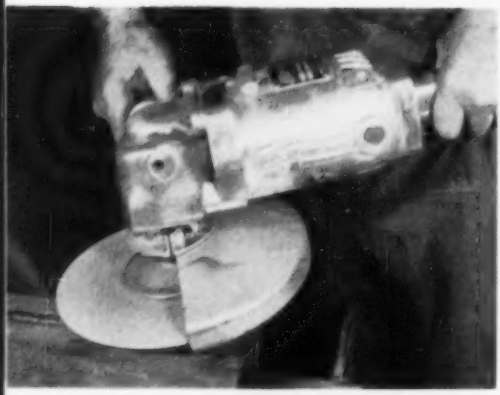
UNITED CHROMIUM DIVISION

METAL & THERMIT CORPORATION

100 East 42nd Street, New York 17, New York • Waterbury 20, Conn.
Detroit 20, Mich. • East Chicago, Ind. • Los Angeles, Calif.

In Canada:
Metal & Thermit - United Chromium of Canada, Limited, Toronto 1, Ont.

For more data circle 180 on Reader Service Card



A Simex Red Wheel being used to grind weld

right angle type portable grinders.

The Simex wheel has a safety web backing of spiral wound rayon auto tire cord, and is designed for grinding welds, removing flash and bead, cleaning up rough ragged surfaces and edges, and for all types of stainless steel.

The Simex wheel is made like a conventional grinding wheel, from a wheel mix consisting of abrasive cutting particles and synthetic resin bonding agents, reinforced with alpha cellulose fibers criss-crossed and knitted together throughout the wheel mass. It is made in depressed center or raised hub shape in 7 and 9 inch diameters by 3/16 and ¼ inch thicknesses.

For more data circle **12** on Reader Service Card

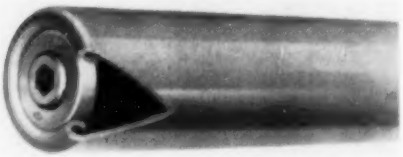
★ ★ ★

Conveyor Roller

An Integral End Conveyor Roller has been developed by The Alvey-Ferguson Co., 666 Disney St., Cincinnati 9, Ohio.

This conveyor roller is mounted on self-contained ball bearings. It is designed to eliminate roller-caused damage to products, packages and cartons, as well as jamming and tieups.

The A-F Integral End Roller houses its bearings in ends which are rolled



Section of conveyor roller showing rolled end

inward to present smoothly rounded end surfaces. This rounded lip design deflects products on and off roller conveyor lines without package or product gouging by roller ends. Rolled design offers the further advantage of extra strength at roller ends with no in-

METABOND

MEANS *PROGRESS* IN RUSTPROOFING

METABOND is the only effective immersion or spray amorphous type zinc coating in the industry today.

METABOND withstands severe and consistent flexing and bending without chipping or breaking bond.

INTERNATIONAL RUSTPROOF CORPORATION

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MANUFACTURERS OF RUST PREVENTIVES AND CORROSIVE SOLVENTS

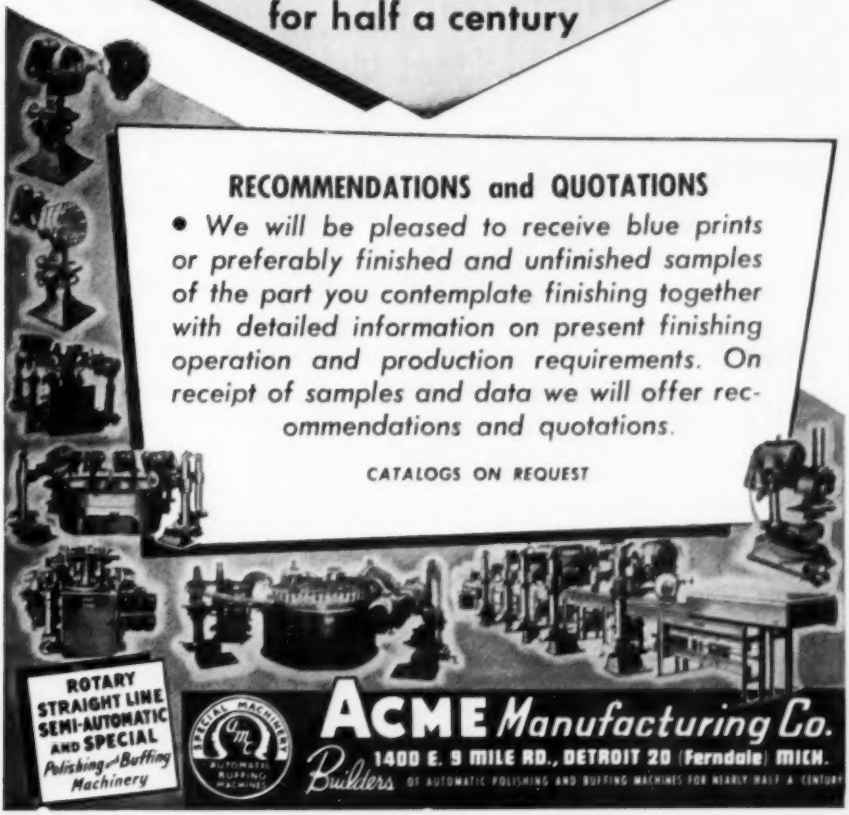
For more data circle **181** on Reader Service Card

ACME Automatics

FOR HIGH PRODUCTION at LOW COST on

POLISHING and BUFFING • DE-BURRING
WIRE BRUSHING and MICRO-FINISHING

• **Proved performance and dependability in industry for half a century**



RECOMMENDATIONS and QUOTATIONS

• *We will be pleased to receive blue prints or preferably finished and unfinished samples of the part you contemplate finishing together with detailed information on present finishing operation and production requirements. On receipt of samples and data we will offer recommendations and quotations.*

CATALOGS ON REQUEST

ROTARY STRAIGHT LINE SEMI-AUTOMATIC AND SPECIAL *Polishing and Buffing* Machinery

SPECIAL MACHINERY — AUTOMATIC BUFFING MACHINES

ACME Manufacturing Co.

1400 E. 9 MILE RD., DETROIT 20 (Ferndale) MICH.

Builders OF AUTOMATIC POLISHING AND BUFFING MACHINES FOR NEARLY HALF A CENTURY

For more data circle **182** on Reader Service Card

crease in weight, it is stated.

End bearings turn about a 7/16-inch hexagonal shaft, and are available in three types: plain, dust-tight and grease-sealed construction. The A-F Integral End Roller is available in two models: 2½-inch diameter 14 gauge steel, and 2¼-inch 16 gauge.

For more data circle **13** on Reader Service Card

Vacuum Coater

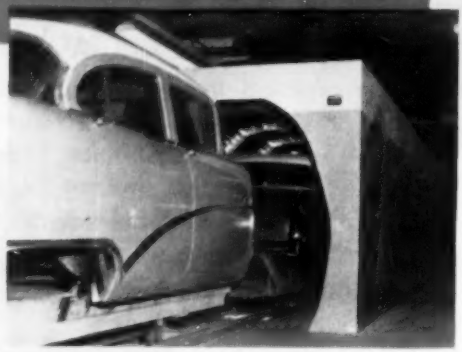
A built-in optical photometer is used to measure coating thickness in a vacuum coater manufactured by American Instrument Co., Inc., Silver Spring, Md. The photometer consists of a collimated light source and a sensitive photomultiplier detector. The detector can be placed to receive light reflected from the work or transmitted through the work.

Thicknesses are measured by recording a change in reflected or transmitted light while the coating is being applied. Space is provided for placing any type of filter in the optical path, and the detector is sensitive enough to record full-scale light reflected from uncoated glass.

The vacuum system features a rapid pump-down cycling time by means of diffusion pump by-pass valves. Standard items also include a water-cooled combination valve and baffle, complete gaging, filament-heating controls and meters, and high voltage electrical power supply. Also included are a needle valve, bleeder valves, and a counter-

LEADING AUTO MANUFACTURERS INSTALL CLEPCO QUARTZ OVENS

Find CLEPCO Quartz Paint Ovens require half the floor space and half the KW input of infra-red bulb ovens.



HERE'S WHY...

CLEPCO Quartz Paint Ovens are based on the use of special CLEPCO Quartz Heaters designed to emit that part of the heat spectrum most readily absorbed by paints.

Another major auto manufacturer reports that CLEPCO Paint Ovens are lower in original cost as well as in operating costs than the conventional gas fired convection ovens previously in use.

CLEPCO'S Complete Research Facilities are at your service to determine the most efficient quartz oven for your requirements.

SEND FOR COMPLETE INFORMATION

THE CLEVELAND PROCESS COMPANY

1965 EAST 57TH STREET • CLEVELAND 3, OHIO

CLEPCO

For more data circle **183** on Reader Service Card

• To electroplaters and plating department heads in every section of the nation, the name ARco is symbolic of broad engineering knowledge . . . advanced methods and equipment . . . bringing top plating results.

Corrosion-resistant ARco rubber coverings are applied to tanks and accessories, Diaphragm Systems, Parts Separators, Air Agitation Systems, Grids and Screens, Ventilation Equipment, Pipes and Fittings, Materials Handling Equipment. For expert advice on economical, efficient rubber applications to electroplating equipment, call on ARco Engineers. Their help is offered to you without obligation.

ARco Lined Open Tank

ARco Covered Pipe, Fittings

ARco Lined Diaphragm Tank

ARco Lined "Handy-Tanks"

ARco Lined Tumbler

ARco Insulated Handling Equipment

ARco Materials, Equipment, Engineering and Service . . . Vital To Better Electroplating

. . .assure improved plating quality and production!

AUTOMOTIVE RUBBER CO., INC.
12564 BEECH ROAD • DETROIT 39, MICH.
Manufacturers • Designers • Engineers

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ARco RUBBER PROCESSORS
4033 Homestead Road
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ARco
FIELD SERVICE UNITS

ARco Field Service Engineers bring their "know-how" and equipment right into your plant. Permanently installed or large equipment can be fabricated and covered on the job by Field Service Units. (Licensed Saran Applicators).

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Please rush me _____ copies of your "Diaphragm Tanks Promote Plating Progress."

Name _____

Firm _____

Street _____

City _____ State _____

For more data circle 184 on Reader Service Card

balanced bell jar hoist mechanism complete with controls. The bell jar is made entirely of aluminum to reduce weight, and the unit is housed in a sheet metal cabinet.

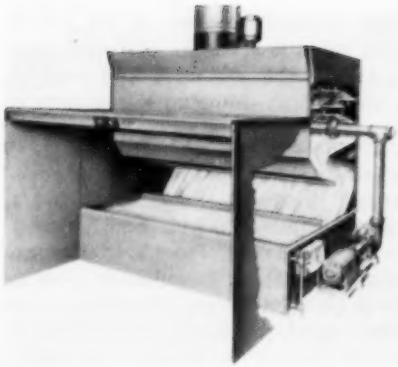
For more data circle **14** on Reader Service Card

★ ★ ★

Semi-Elevated Water Wash Spray Booth

The M & E Mfg. Co., 2571 Winthrop Ave., Indianapolis, Ind., has announced a semi-elevated water wash paint spray booth incorporating improved design features which are said to protect against fire and explosion hazards, and to increase operating efficiency.

The wash chamber section is elevated above the dry section of the booth. A heavy down-flow of water falling on the back wash curtain creates a filtering point of entry through which all paint particles must attempt passage before reaching the principal wash action process of the water chamber section. Through this process, much of the paint residue is knocked down and safely contained within the water reservoir tank.



M & E Semi-Elevated Water Wash Spray Booth

This spray booth is available in a complete range of sizes.

For more data circle **15** on Reader Service Card

★ ★ ★

Large PVC Sheets

A custom sizing policy for polyvinyl chloride corrosion-proof lining and structural material has been announced by Kaykor Industries, Inc., Yardville, N. J. F-92 unplasticized structural plastic is now available in sheets 44 inches wide by any length desired to a standard maximum of 144 inches. Even longer continuous lengths are available on special order.

Thicknesses of F-92 structural PVC which are now available in larger custom lengths range from 1/16 to 3/8 inch. Complete specifications are available on request to Kaykor Industries, Inc.

For more data circle **16** on Reader Service Card

FUNCTIONAL FINISHES!!

If you require your coatings to accomplish some specific task — something beyond mere ornamental appearance or average longevity —

Try Us!

We make ACRYLIC, ALKYD, CELLULOSIC and VINYLOID coatings for a very wide range of specialized industrial applications.

The Varnish Products Co.

5204 Harvard Avenue
Cleveland, Ohio

For more data circle **185** on Reader Service Card

Samuel H. Davis, general foreman, checks finish on bumpers.

RHEEM AUTOMOTIVE COMPANY CUTS PRODUCTION COSTS WITH WYANDOTTE B.N.

The Rheem Automotive Company, of Vernon, California, is a leading manufacturer of automotive springs and bumpers. Its new plant, now under construction at Fullerton, California, will house the largest plating installation on the West Coast.

Because of its high manufacturing standards, Rheem insists upon high quality from all its suppliers. In the manufacture of automobile bumpers, where a gleaming finish is so important, great care must be exercised in the metal-cleaning operations. Wyandotte B.N. helps make this job easier and more economical.

Wyandotte B.N. is a versatile cleaner that does many jobs well. Rheem Automotive Company uses it as a soak cleaner, and as both an anodic and cathodic electrocleaner. They report excellent cleaning results. Wyandotte B.N. helps them keep cleaning costs low, too, because it has an exceptionally long cleaning life. And, with Wyandotte B.N., rejects are cut to a minimum!

In addition to Wyandotte B.N., Rheem Automotive Company uses three other Wyandotte metal cleaners: Industrial No. 38, P-1075, and MK.

Wyandotte's complete line of industrial cleaning products can help you improve the quality of *your* finishes. Your Wyandotte representative can show you how to get top efficiency and lower use-cost in *all* of your industrial cleaning operations. Give him a call today. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, California. Offices in principal cities.*

Wyandotte
CHEMICALS
J. B. FORD DIVISION

For more data circle 186 on Reader Service Card

Quick-Cut Compound

Where fast deburring and stock removal are to be accomplished in a short time, Lorco "QC" (quick cut) will do the job, states Lord Chemical Corp., Dept. PF, 2068 S. Queen St., York, Pa. This abrasive compound for barrel finishing should not be used where runs longer than six hours are necessary.

Lorco "QC" produces a smooth finish and good color. It is used with abrasive chips, generally at low water level, and is also suited to the self-tumbling of small parts.

For more data circle **17** on Reader Service Card

★ ★ ★

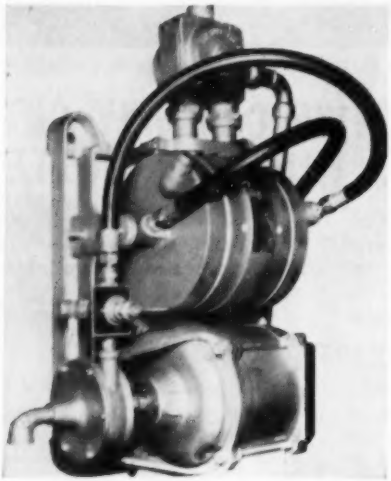
Tarnish Protective Paper

A chemically treated packaging paper for protecting silver and silver plated objects from tarnish has been announced by the Protective Packaging Division of the Daubert Chemical Co., 333 N. Michigan Ave., Chicago 1, Ill. The product, called "Nox-Tarnish," is said to be capable of reacting with tarnish-producing sulfides in the atmosphere and thus protecting silver from tarnish.

The manufacturer recommends the use of this chemically treated paper as a case liner or an intimate wrap for silver plated articles. It is desirable to completely line with Nox-Tarnish any carton or package which might be constructed of sulfide bearing materials. This not only protects the silver from contact with such materials, but prevents air from entering the package at "breathing points." Complete sealing is not necessary, however.

For more data circle **18** on Reader Service Card

HOT SPRAY cuts rejects on production lines



Standard industrial finishes can be expected to give better coverage and more mileage when used with the new, all-electric Circaflo 600.

Uniform viscosity and controlled temperatures permit one coat of high-solids film to replace two coats, for a faster, sag-proof application. Many paint department bottlenecks are eliminated with the Spee-Flo Hot Spray process. Simple and maintenance-free, the Circaflo is now in production by the Spee-Flo Company. Write for free booklet "Why Hot Spray?" to **Spee-Flo Company**, Dept. P.F.-2, Houston, Texas.

For more data circle **187** on Reader Service Card

10 REASONS WHY THE COUNTRY'S FINEST COATERS USE

MICCROSOL

VINYL PLASTISOL

FOR INDUSTRIAL COATING!

1. They know that MICCROSOL is the highest quality material they can use.
2. MICCROSOL has become the accepted standard for coating plating racks, baskets, hangers, hooks, fixtures, ducts, tanks, tools and many other parts.
3. The strength, toughness, scuff- and abrasion-resistance of MICCROSOL give your coatings longer life.
4. The permanent flexibility and positive, continuous adhesion of MICCROSOL enable them to meet the strictest specifications and technical requirements, for protective coatings.
5. They can depend on MICCROSOL to keep their reputations, and the quality of their work, at the highest level in the industry.
6. They have helped us develop MICCROSOL to its present point of perfection.
7. MICCROSOL is easier to apply. Gives you better coatings for less money.
8. MICCROSOL responds to their skill and experience. Helps them give you the rugged coatings you need to protect work and your equipment.
9. MICCROSOL coatings last longer.
10. They can depend on MICCROSOL!

You can't blame us for being proud of the quality of the coating work produced by our customers. We have worked with them, and for them, to the very best of our ability, during the phenomenal growth of the coating industry. We know them well, and appreciate their loyalty and support. And we hope to have the privilege of serving them all for many years to come.

There's a MICCROSOL Coater located in your vicinity. He's undoubtedly the leader in his field. If you want superior coating jobs, we'll be glad to help you get in touch with him!

It's Tops!

Developed and Manufactured by Experienced Platers

MICCRO Products

MICHIGAN CHROME *and Chemical Company*

8615 Grinnell Avenue • Detroit 11, Mich.

For more data circle 188 on Reader Service Card

Temporary Protective Coating

Guard Coatings Corp., 8-05 43rd Ave., Long Island City, N. Y., has announced MetalGuard, a strippable plastic coating for protecting highly polished surfaces during fabrication, handling and storage.

Metal protected with MetalGuard strippable plastic temporary protective coating can be formed without damaging polished surface

MetalGuard is sprayed on and dries to a tough, clear film that withstands manufacturing operations such as drawing, blanking, drilling, routing, form rolling, riveting, and shipping, and protects against scratches, rust, oil, grease, mark-off, and splatter by acids and alkali. When MetalGuard is peeled off, the product emerges factory fresh.

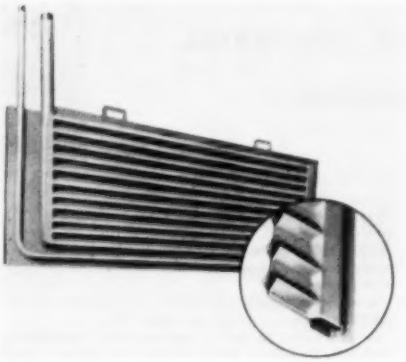
MetalGuard can be sprayed on stainless steel, glass, vitreous enamel, chrome, nickel, decorative laminates and plated surfaces. It is also available formulated for brushing or dipping.

For more data circle **19** on Reader Service Card

★ ★ ★

High Pressure Platecoils

An increase in pressure rating for two styles of Platecoil heat transfer units has been announced by Tranter Manufacturing, Inc., Lansing 4, Mich. Tranter Platecoils consist of embossed sheets of metal welded together (or to a flat companion plate) to form chan-



Platecoils now have higher pressure ratings

MORSE VERTICAL DRUM TRUCK

ROCK-A-DRUM

Picks up 55 gal. drums, rolls them over for side draining. Becomes a rugged stand on 3" wheels.

MORSE MFG. CO., INC. 762 W. Manlius St. East Syracuse, N.Y.

For more data circle **189** on Reader Service Card

Telephone collect for free brochure on

STRIPPING COPPER

with

McKeon's "Liquid Sulphur"

Economical, fast, non-electrolytic.

Sulphur Products Co., Inc.

228 McKEON WAY GREENSBURG 6, PA.

For more data circle **190** on Reader Service Card

Thoroughly Cleans Batches of Metal Parts *Automatically*

Since the first automatic cleaning machine featuring the Magnus Method of mechanical agitation was designed and built, industry has been quick to adopt this new cleaning method. It has proven itself in the production lines of many well-known manufacturing plants.

In the Magnus Aja-Lif Automatic, a 2-stage wash and rinse machine, baskets of parts are automatically loaded and carried through the tanks where they are vigorously agitated in the cleaning and rinsing solutions for a pre-determined length of time. Additional stages can be added for any number of subsequent operations. Solvents, alkaline or acid solutions can be used.

Hinge sections before and after cleaning in Magnus Aja-Lif Automatic.

This is only one type of a complete line of Magnus mechanically agitated cleaning machines. Before you decide on *any* kind of production cleaning setup, let us show you what the Magnus Method has accomplished for others and can do for you. Ask for your copy of Bulletin 10,000 G. Magnus Chemical Co., Inc., 205 South Avenue, Garwood, N. J.

magnus

Industrial Cleaning Division

MAGNUS CHEMICAL CO., INC.

For more data circle **191** on Reader Service Card

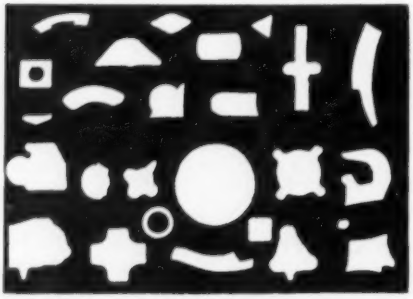
nels for the passage of heating or cooling media.

Pressure ratings have been increased for two styles of header-type, double-embossed units. The units now are offered for use up to 150 pounds maximum operating pressure; previous maximum recommended by the manufacturer was 100 pounds.

The increased rating retains the 1 to 4 factor of safety between maximum operating pressure and rupturing pressure. The pressure limitations apply to Platecoils made of cold rolled steel and the various alloys in which they are available.

The increased rating for the double-embossed, header-type units broadens the application potential of the Style 70 and 90 Platecoils.

For more data circle **20** on Reader Service Card



Pre-Cut Masks Speed Finishing

Brady Pre-Cut Masks are self-sticking — go on fast and accurately. Protect from finishing to inspection. Hundreds of shapes and sizes in stock, for paint spraying, baking, tumbling, etc. Specials made to order. Fast delivery. Distributors in 150 cities.

Write for free samples and Bulletin 160-C.

W. H. Brady Co.

746 W. Glendale Ave., Milwaukee 12, Wis.

For more data circle **192** on Reader Service Card

Germanium Rectifiers

Germanium rectifiers in both self-contained and remote-controlled models have been announced by Hanson-Van Winkle-Munning Company, Church St., Matawan, N. J.

All models are designed for continuous, 24-hour operation at full capacity. The models cover a voltage range from 6 to 48 volts with current output from 500 to 10,000 amperes. At full load with output voltages of 15 volts and above, the H-VW-M rectifier is over 90 per cent efficient, the company states. Even at ¼ and ½ load, efficiencies are high due to characteristics of the germanium junction. Voltage regulation as low as 5 per cent can be obtained from no load to full load at voltage ratings of 20 volts and above.

Each unit is cooled by a totally-enclosed, motor-driven fan. The unit is safeguarded from overloads and d.c. line shorts by link-type fuses in the output circuit. A magnetic contacter and other devices supply normal over-current and under-voltage protection.

For more data circle **21** on Reader Service Card

★ ★ ★

Tack Cloth

The introduction of a production tack cloth, designed for easy removal of lint, dust, abrasive grain, metal and paint particles in all finishing and refinishing operations, has been announced by Permacel Tape Corporation, New Brunswick, N. J.

Permacel 091, the Production Tack Cloth, is designed to pick up and hold foreign material, preventing the spreading or scattering of the unwanted particles. Treated with a special impregnant, it is particularly effective in automobile, truck, bus, aircraft and radio finishing and refinishing.

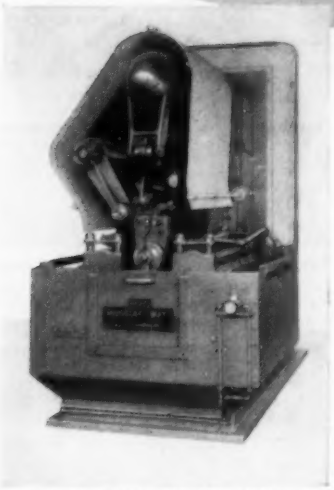
Each Permacel cloth is folded to a convenient hand size pad.

For more data circle **22** on Reader Service Card

To page 120→

FLAT POLISH

Slash production costs EIGHT ways with MICRO-POLISH



Standard Micro-Polish unit. May be used singly or in tandem.

1. Pre-polishes faster and better than any type of contour polishing.
2. Cost per square foot is lowest of any method.
3. Usability of lower steel grades gives big initial stock saving.
4. Improves press and die action.
5. Pre-polished steel gives outstanding results with exacting, modern plating practices.
6. Provides uniform surface, affording maximum protection with minimum plating.
7. Finishing before forming shows lower unit cost.
8. Base metal finishing eliminates rejects.

"Complete Package"

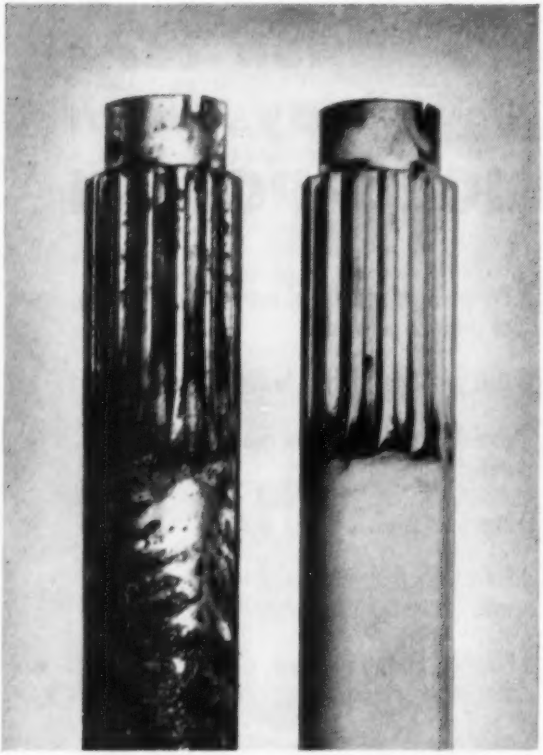
Murray-Way will engineer a complete automatic finishing line or a single machine. For complete information—CALL OR WRITE

MURRAY-WAY CORPORATION
P. O. BOX 180, MAPLE ROAD EAST
BIRMINGHAM, MICH.
AUTOMATIC BUFFING, GRINDING, POLISHING AND FILTERING EQUIPMENT

MURRAY WAY

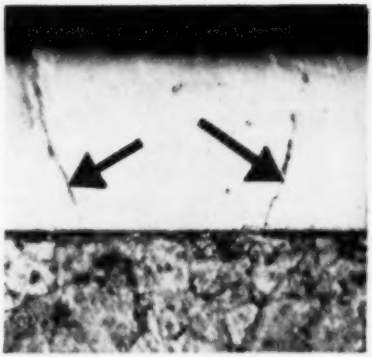
For more data circle 193 on Reader Service Card

At last! Superior Protection with

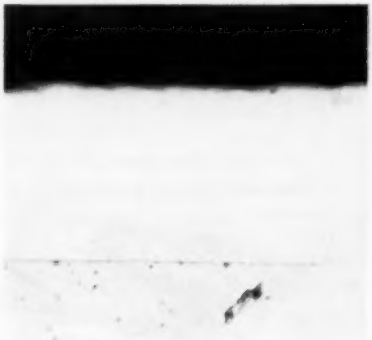


Surface of steel shaft at left, with 0.0005 inch of ordinary chromium, showed rust over entire surface after 100-hour salt spray test.

Shaft at right, with 0.0005 inch of Crack-Free Chromium, was virtually unaffected in the same test.



Photomicrograph showing cross section of etched ordinary chromium plate .00125" thick. Some cracks extend through the deposit to the steel.



Photomicrograph of a cross section of etched Crack-Free Chromium also .00125" thick. Note the absence of cracks.

UNICHROME Trade Mark

COATINGS FOR METALS

UNITED CHROMIUM DIVISION
METAL & THERMIT CORPORATION

100 East 42nd Street, New York 17, N. Y.
Detroit 20, Mich. • Waterbury 20, Conn.
East Chicago, Ind. • Los Angeles, Calif.
In Canada: Metal & Thermit-United Chromium of Canada, Limited, Toronto 1, Ont.

New Crack-Free Chromium

Now... more corrosion-resistant chromium plating made possible by Unichrome Crack-Free Chromium Process

Here's the new production process that solves a basic problem . . . that of getting a chromium deposit free from corrosion-admitting cracks. Again an important and long awaited advance in chromium plating has been achieved by United Chromium.

Unichrome Crack-Free Chromium Plating gives ductile deposits which, unlike ordinary chromium deposits, do not crack as thickness builds up. These crack-free finishes assure longer service life, greater reliability and protection.

Look what you gain with Unichrome Crack-Free Chromium Plate

- Much better protection against corrosion than with ordinary hard chromium
- Remarkable leveling action covers surface imperfections
- Improved non-galling, non-seizing properties
- Easier, faster grinding
- Resistance to thermal shock — better protection at elevated temperaure
- Impact resistance
- More ductile deposit
- Easy buffing — as easily as dull nickel

Superior Corrosion Resistance

In hard plate thicknesses, Crack-Free Chromium gives striking results. Even when plated directly on the base metal, it provides a dependable barrier to corrosion. Ordinary chromium of the same thickness is full of cracks—cracks so small they are usually not visible to the unaided eye. Many of these cracks extend all the way down to the base metal, making it impossible for ordinary chromium alone to deliver complete protection against corrosion.

In 100% relative humidity tests conducted at 100° F, parts plated with .0003" of Crack-Free Chromium were rust-free after a full year of exposure. Parts plated with ordinary chromium were completely covered with rust after just a few days. In laboratory and outdoor exposure tests, Crack-Free Chromium has proved its superiority time and time again.

Two-Tone Finish

A matte gray plate, Crack-Free Chromium buffs up readily, like dull nickel, to a high lustre. You can get smart two-tone effects by coloring up only portions of the work.

Conserves Nickel

Since it develops a dense, continuous deposit, Crack-Free Chromium doesn't depend on scarce nickel to stop corrosive agents from reaching the base metal. It protects all by itself . . . can be plated directly on steel and zinc die castings for many applications.

Easy Operation

The Unichrome Crack-Free Chromium solution is of the self-regulating type. Important constituents are automatically regulated, simplifying plating operations and solution maintenance.

Send for Bulletin CFC-1. Or ask for a United Chromium engineer to give you details personally.

For more data circle 194 on Reader Service Card

Spray Plastisols

Two new types of spraying plastisols that can be sprayed on cold metal in a vertical position without sagging when applied over Stanley Plastisol Primer No. 40X-415 have been announced by The Stanley Chemical Company, 31 Berlin St., East Berlin, Conn., a subsidiary of The Stanley Works.

Both types are true plastisols and contain no volatile ingredients. The manufacturer states that these plastisols have extremely high gloss when applied according to directions, and can be sprayed at 100 per cent solids.

Type I is recommended for film thicknesses of from 10 to 15 mils, and is available in a range of colors for decorative finishes for use on automatic washing machines, dishwashers and similar products.

Type II is available in black and is recommended for film thicknesses of from 50 to 60 mils without heating between coats. This type is designed for lining chemical storage tanks, tank cars and comparable equipment.

For more data circle **23** on Reader Service Card

★ ★ ★

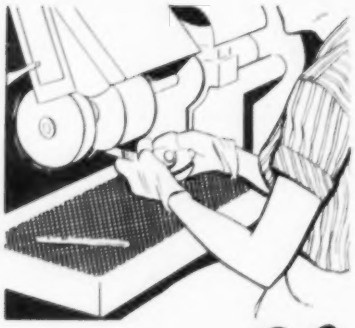
Anti-load Finishing Paper

No-Load Finishing Paper has been introduced by the Coated Abrasives Division, Armour and Co., Alliance, Ohio.

In the sanding of soft materials such as paints, lacquers, and enamels, the abrasive "loads." This is caused by an accumulation of the soft particles between the abrasive grains. When the particles have built up to the level of the grains, the sheet becomes smooth and will no longer cut.

No-Load Finishing Paper is available in Crystolon (R) for the automotive and appliance industries in the form of hand sheets, discs, and cut sheets for machine sanders. Crystolon

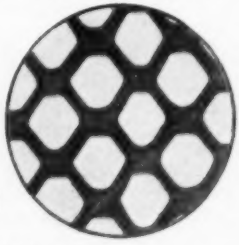
PROTECT FINE PLATED SURFACES



with **RP** *Neotex*

Neotex . . . the open pattern Neoprene rubber matting, protects highly polished finishes when used to line any surface where goods are worked on or in transit. In roll form, Neotex can be easily cut to any size or shape . . . it's rugged and long lasting, resistant to abrasives, caustics, heat, acids, oils, oxidation. Open pattern permits buffing compounds to settle. Available in a fine or coarse pattern. Write for complete information.

RP *Neotex*



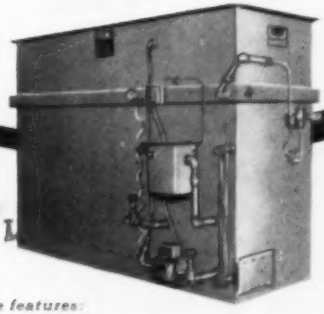
RESEARCH PRODUCTS CORPORATION

Dept. 76, Madison 10, Wis.

For more data circle **195** on Reader Service Card

The **CIRCO** *degreaser!*
revolutionary new design means:

30% LESS SOLVENT!
40% LESS MAINTENANCE!
LASTS TWICE AS LONG!



No other degreaser has ALL these features:

CORROSION RESISTANT COILS—Condensate coils are one-piece spiral copper tubing with nickel plated exterior surfaces. Exterior resists degreasing solvents and hydrolysis . . . interior is superior to galvanized pipe for water transport.

RECESSED CONDENSING COILS—Condensing coils are recessed and placed directly over the storage tank, providing smooth, obstruction-free walls and easy operation.

DOUBLE THE LIFE—Water condensation and resultant hydrolysis will not take place along sides, causing them to rust. No rusty condensate troughs to patch or replace...a tremendous improvement, doubling the life.

LEAK-PROOF PUMP—Circo's new pump has performance, corrosion resistance, longevity and non-leaking qualities. All pumping parts are fabricated of stainless steel . . . the rotor and end plates are nickel clad. The new Circo pump, without stuffing box, rotary seals, coupling drive sheaves, or V belts, uses a rotating magnetic field to drive the impeller, and is virtually foolproof. It's safely sealed—leaking is impossible.

DEMAND TYPE WATER CONTROL—A water temperature regulator to accurately control water in the coil and insure a 90° to 120° F. temperature for water entering the water jacket, eliminates water condensation which would result in hydrolysis, rusting and acid solvent.

CIRCO DEGREASERS—for every need are available in corrosion-resistant compact units for the small shop, large automatic models for mass production, and all sizes between. Sturdy and dependable vapor, solvent-vapor-solvent, vapor-spray and ultrasonic models make Circo the standard for performance and long life.

Complete information on request.
Bulletin OP2 on solvent degreasers
Bulletin UC1 on ultrasonic equipment
Bulletin S21 on metal washing equipment

CIRCO EQUIPMENT COMPANY **CIRCO** *Since 1923*

51 Terminal Avenue, Clark (Rahway), New Jersey
OFFICES IN PRINCIPAL CITIES • NATION-WIDE ENGINEERING FIELD SERVICE

For more data circle **196** on Reader Service Card

No-Load is immediately available in grits 240, 280, and 320. Other grit sizes will be added as demand develops.

Features and advantages claimed for the No-Load Finishing Paper are:

1. Tough flexible backing. It contains a special rubber base incorporated by a paper treating process which prevents "slipping" in the operator's hands. Armour No-Load is "easy" on the operator's hands because he exerts less pressure on the sheets while sanding.

2. Binder adhesive. Specially formulated for the No-Peel grain layer. This prevents "grain shedding" when sanding sharp or rough edges.

3. Added sharpness. Built in by means of an improved method of electrostatic grain coating.

4. Has a "non-filling" surface coating which won't come off when moistened or during sanding operations.

For more data circle **24** on Reader Service Card

★ ★ ★

Masking Tape Package

A box, ½-inch smaller in length and width and requiring less stock space, has been developed for individually - packaged, 60-yard rolls of Behr-cat brand pressure-sensitive tapes. Packaged in this length are strapping, standard and high-temperature mask-

3 LBS.
11 OZS.
OF
PAINT
BUILD-UP

STRIPPED IN 2 MINUTES!

By
KOLENE
PROCESS

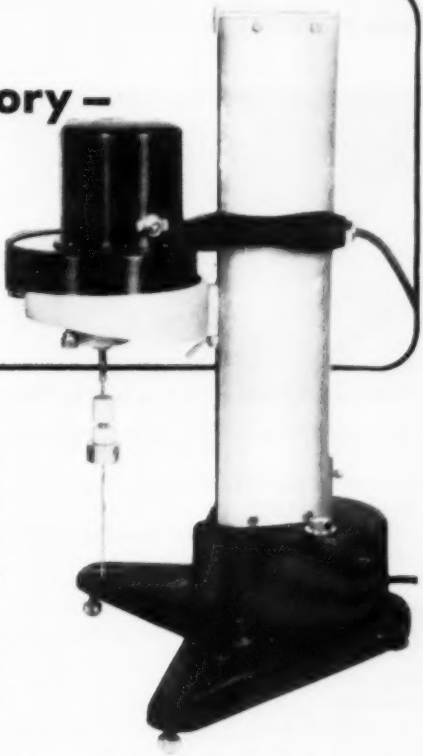
Descriptive bulletin and additional information available upon request.

KOLENE CORPORATION
12892 WESTWOOD AVENUE
DETROIT 23, MICHIGAN

Originators and Suppliers of Kolene Chemical Processes and Equipment

For more data circle **197** on Reader Service Card

a MUST for your laboratory – Brookfield Helipath Stand



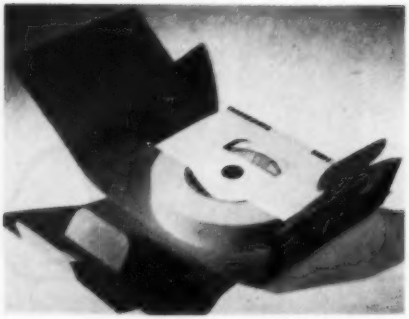
Non-flowing substances are no longer viscosity-measurement and control problems! The Brookfield Helipath Stand, coupled with your Brookfield Viscometer, actually makes it easy to test, study and control the viscosity of highly-plastic materials, gels and semi-gels.

Regardless of structure, the Brookfield Helipath Stand allows accurate viscosity measurement by automatically lowering a special bar-type spindle through the test material. Throughout its helical path, the spindle constantly measures undisturbed material. Precision engineered, quality manufactured, the Brookfield Helipath Stand is an instrument no laboratory should be without.

FREE ! *Write, wire or phone for your copy of Brookfield's fully-illustrated brochure.*

Brookfield
ENGINEERING LABORATORIES, INC.
STOUGHTON 51, MASSACHUSETTS

For more data circle 198 on Reader Service Card



Behr-cat Masking Tape in compact container

ing tapes, freezer, drafting, and color tapes.

Introduced by Behr-Manning, Division of Norton Company, Troy, N. Y., the box has been designed to include an integral roll centering and locking device. This feature eliminates the need for inserting an individual centering device with each roll and makes handling and re-storage easier.

For more data circle **25** on Reader Service Card

★ ★ ★

Shuttle-Drive Conveyor

Industrial Filtration Company, 166 Industrial Ave., Lebanon, Ind., has announced the Delpark Shuttle-Drive Conveyor, designed for material handling applications. This oscillating conveyor for industrial applications is available in stationary or portable models, which are hydraulically and mechanically operated.

The Delpark Shuttle-type Conveyor operates with any trough or trench. Mechanically or hydraulically operated shuttle-drive bar rests on the bottom at either side or the center. Hinged to the drive bar at intervals are blades which open to the width of the trough as the drive bar starts its forward movement. The blades advancing with the drive bar move material in the trough to the maximum forward stroke of the drive bar. As the movement is reversed, the blades fold back against the drive bar and by-pass the material advanced by the blade in back. As the forward stroke is again begun, the blades open and advance the material in successive steps.

Trough and blade widths are in two inch progressive sizes from six inches to thirty inches. These conveyors are practical for installations of great length with low head room requirement. They operate on a single level without the necessity of a second level return. The level operation permits the movement of material from small feeder conveyors to large capacity centralized conveyors of the same design. The material from localized operations can be fed into central disposal systems.

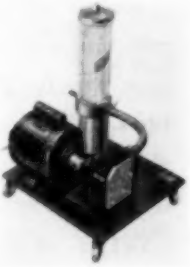
For more data circle **26** on Reader Service Card

★ ★ ★

Plastic Filter Pumps

Sethco Manufacturing Company, 70-72 Willoughby St., Brooklyn 1, N. Y., has announced a redesigned line of plastic filter pumps designed to filter corrosives.

These pumps are useful in filtering solutions where metal contact must be avoided. Filter will remove particles down to 1 micron in size.



Sethco self-priming plastic filter pump

The Sethco LBNI series of plastic pumps incorporates a plastic filter assembly mounted on a linen impregnated phenolic panel and coupled to a totally enclosed ball bearing ¼-h.p. motor. The pumps are mounted on rub-

"TAKE-OFF" TIME IS VITAL!

QUICK-STRIP #8

NEW non-inflammable PAINT STRIPPER takes off enamel, varnishes, lacquers and film in less time, *every time!*

INSTANTANEOUS STRIPPING ACTION . . . *QUICK-STRIP* #8 removes most finishes with amazing rapidity, yet without detrimental, corrosive effect.

WATER RINSIBLE . . . *QUICK-STRIP* #8 is a water flush-off remover that leaves a clean metal surface for subsequent operations.

ECONOMICAL & EASY TO USE . . . Applied by dip, brush or spray at room temperature. Uniform stripping action. Will not affect ferrous or non-ferrous surfaces.

QUICK-STRIP #8. Available in 5 gallon or 55 gallon containers.

For cold emulsion cleaning requirements investigate our NEW Emulsion Cleaner #26.

Mitchell-Bradford

MITCHELL-BRADFORD CHEMICAL CO.
WAMPUS LANE MILFORD, CONNECTICUT

QUALITY PRODUCTS OF CHEMICAL RESEARCH

For more data circle 199 on Reader Service Card

ber tires or casters, and thus are portable. Models are available with capacities ranging from 50 to 200 g.p.h.

Pump body, pump impeller and filter assembly are each available in a wide variety of chemical resistant materials to suit the individual application.

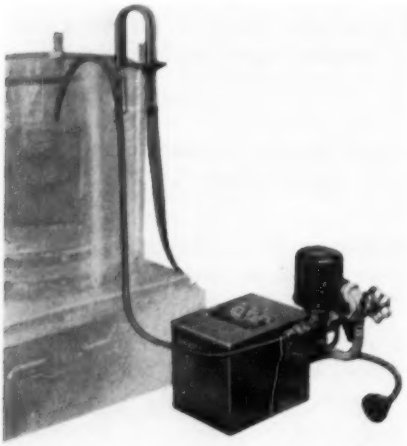
Filter tubes are available in cotton, Dynel, porous stone and porous carbon.

For more data circle **27** on Reader Service Card

★ ★ ★

Portable Liquid Leveler

Applicable to all open type liquid containers and operating in any elec-



Blue M Portable Electronic Liquid Leveler

trically conductive liquid, a Portable Electronic Liquid Leveler, announced by Blue M Electric Co., 138th & Chatham Street, Blue Island, Ill., automatically maintains liquid level of bath mediums within a level constancy of plus/minus 0.046 inches.

This unit includes electronic relay, high and low level stainless steel 18-8 probes, and a solenoid valve.

The electronic relay contains thyrathron actuated relay. A three microamp current flow produces a positive action. The probe circuit is isolated from line voltage through a transformer. Power failure or tube burnout automatically cuts off relay.

The device operates on 115 volts 50/60 cycle a. c. The Blue M Portable Electronic Liquid Leveler is designed for all laboratory, pilot plant, and production where exacting level constancy is important.

For more data circle **28** on Reader Service Card

★ ★ ★

Drying System

A drying method employing the principle of greatly accelerated evaporation, for the high speed drying of a wide range of inks, coatings, resists and adhesives has been announced by the General Research & Supply Co., 572 S. Division Ave., Grand Rapids 3, Mich. Known as the General Thermo-Jet, the dryer is particularly adaptable to silk screen process work, to printed electronic circuits and to a wide variety of decorating and coating operations wherever the solvents involved dry by evaporation.

This system consists of blowing large quantities of warm air at high velocity through a perforated plate suspended about one inch above the work which is carried on a moving conveyor. This produces many tiny jets of warm air which strike the wet ink or coating. The action of the warm air jets not only raises the solvents to the boiling point but also blasts away the rising vapors thus preventing the formation of a vapor blanket which would tend to retard evaporation.

Thermo-Jet Dryer units are built in two basic sizes which can be assembled with the necessary conveying means to cover the specified sheet size and to meet required drying conditions. Either electric or gas heating can be provided

Now... the desirable physical characteristics of rhodium at lowest cost!

Sel-Rex

Bright Rhodium PROCESS

Rhodium plating for industrial applications is now an economical process, thanks to another great advance in plating technique by the creators of Sel-Rex Bright Gold.

Sel-Rex Bright Rhodium meets the need of industry for a simple, stable process to produce high quality results under a wide range of plating conditions. It produces the most desirable characteristics of rhodium — hardness (775-820 Vickers, electroplated), a brilliant highly reflective surface which resists corrosion and will not tarnish under any atmospheric conditions.

The Sel-Rex Bright Rhodium concentrate, is refined by a special process which assures *consistent* high purity and best possible electroplating results.

Sel-Rex Bright Rhodium actually plates bright longer than other rhodium processes.

This has been proved in our own laboratories and in numerous commercial plating installations throughout the country. You get excellent conductivity and reflectivity whether the thickness is less than ½ or greater than 10 one-millionths of an inch. Heavier deposits produce a bright hard surface that is desirable for sliding or wiping electrical contacts where light or heavy pressures and low contact resistance are required.

See for yourself why Sel-Rex Bright Rhodium has been 'written up' in the original job specifications of prominent commercial organizations and government agencies. Send for free literature covering technical data and applications.

Sel-Rex Precious Metals, Inc.

Dept. PF-2—229 Main Street, Belleville 9, N. J.
Newark Detroit
Manufacturers of Sel-Rex Bright Gold and Sel-Rex Silver Sol-U-Salt

For more data circle 200 on Reader Service Card

and there is a thermostatically controlled re-circulating system to conserve heat.

The Thermo-Jet Dryer can be operated independently or can be connected directly to a printing press coater or other equipment.

The General Research Thermo-Jet Dryer

For more data circle **29** on Reader Service Card

★ ★ ★

Transparent Metal Lacquer

Pyroxylin Products, Inc., 4851 S. St. Louis Ave., Chicago, Ill., has developed a transparent lacquer for aluminum frames, spandrels, siding and doors. It serves as a protective coating against weathering, corrosion and pitting. Called Pyroxocote No. 26-105, the lacquer may be used on brass, bronze, steel, "white" and die cast metals. Application is by spray gun, dip tank, brushing, flow coating or roller coating.

The lacquer inhibits corrosion and weathering on aircraft, buses, trailers, signs and sheet metal. It is non-yellowing even under marine exposure, and is easy to clean and maintain, the manufacturer states.

When an aluminum surface is dull or weathered, or must pass salt spray test, the manufacturer advises use of a phosphatizing agent called Prox-Prep No. 22-227 prior to painting.

For more data circle **30** on Reader Service Card

★ ★ ★

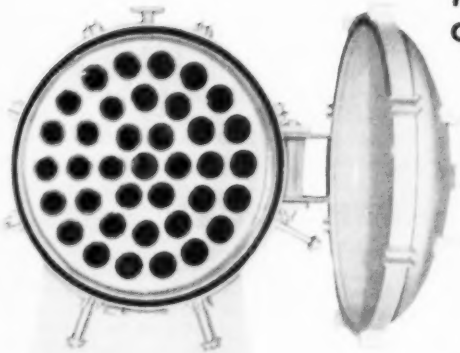
Tilting Tumbling Machine

The Baird Model H Oblique Tilting Tumbling Machine has been announced by the Baird Machine Co., Dept. PF, Stratford, Conn. It introduces features that are said to improve operation and add safety and convenience for the operator. There are few moving parts; controls and adjustments are conveniently located and bottle barrels are easily emptied by manual-

Model H Oblique Tilting Tumbling Machine

hydraulic or power tilting. Little floor space is needed and machine is off-

New!...TUBULAR FILTERS
By INDUSTRIAL



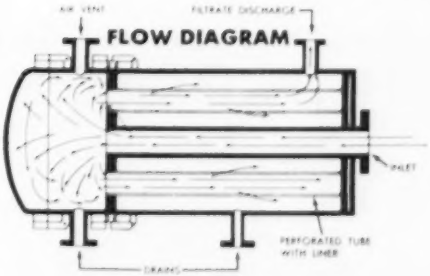
FLOW FROM INSIDE TUBE OFFERS NEW CONVENIENCE

- ★ Unequaled simplicity of maintenance.
- ★ Solids can be recovered in dry form.
- ★ Liners are easy to replace and inexpensive.
- ★ Ideal for intermittent or continuous operation.
- ★ Chamber can be emptied without losing cake.
- ★ No unfiltered "heel."
- ★ Can be used with or without pre-coat.
- ★ Ideal for polishing . . . as a trap filter . . . and as a scavenger for larger filters.

NEW SIMPLIFIED OPERATION

The filter is prepared for use by simply rolling flat sheets of filter paper and inserting them in the tubes, which are designed to force the paper snugly against the tube wall.

EASY TO CLEAN . . . Filter papers are simply withdrawn and replaced. Even the tubes are easy to remove, held in place by a simple rubber O-Ring. Except for the cover there are no nuts and bolts to handle.



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Industrial
INDUSTRIAL
FILTER & PUMP MFG. CO.
5904 OGDEN AVENUE • CHICAGO 50, ILLINOIS

For more data circle 201 on Reader Service Card

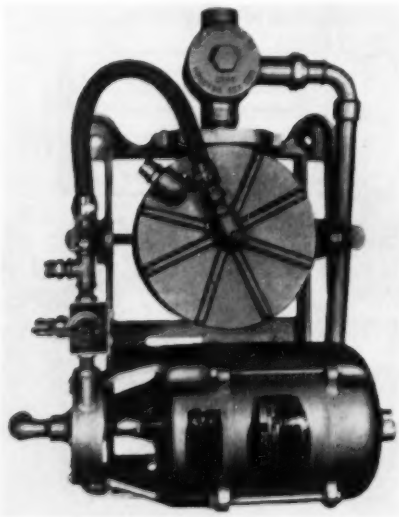
set on base for solidity. The motor acts as balance for the load. Barrels of different shapes and materials may be mounted on the Model H machine to suit individual requirements.

For more data circle **31** on Reader Service Card

★ ★ ★

Paint Heater

The finishing department that has frequent color changes will find the Circaflo Special hot spray unit announced by the Spee-Flo Company, which features a new quick change color selector system, most helpful. A new design selector valve is combined with the experience-proved Spee-Flo heater to offer the advantages of hot spray for the installation which requires frequent color changes, as well as for the continuous duty single color operation. Because clean-out and color change take less than a minute, the Circaflo Special will serve where a separate heater would otherwise be required for each color, the manufacturer states.



Spee-Flo Circaflo Special Hot Spray Heater

Although the hot spray process is not new, this development represents another step in the expanding use of the hot spray method. Literature illustrating the Circaflo Special, as well as a booklet, "Why Hot Spray?" is available free of charge by writing the Spee-Flo Co., 720 Polk Ave., Houston, Texas.

For more data circle **32** on Reader Service Card

NEW BOOKS

Heater Selection Guide. A handy selector guide for determining the type and size of heaters for various surface heating applications is offered in a bulletin announced by the General Electric Company, Schenectady 5, N. Y.

Designated GEA-6146, the four-page guide shows which type of heater to use for specific jobs, how to determine heater rating, how to calculate heat-up time, and how to select thermostats and controls.

Illustrations and tables are used extensively to make surface heating equipment selection as simple as possible, for small applications or large.

★ ★ ★

Effect of Surface Finishing of Non-Ferrous Base Metals on Protective Value of Plated Coatings. A Report on A.E.S. Research Project No. 4. Project director, George J. Kahan; associates: W. W. Macchia and J. M. Fairbank. Published by the American Electroplaters' Society, Inc., 445 Broad St., Newark 2, N. J. Price $0.45.

Project No. 4 was created to extend to non-ferrous metals the work done at the NBS, which was limited to steel. Since in commercial use the final finishing operation on a brass article rarely is polishing, but mostly buffing, satin finishing, bright dipping or tumb'ing, this project deals with these methods so far as brass is concerned. Experimental data for the various operations performed, test results, and conclusions are given.

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For more data circle 202 on Reader Service Card

News of the Industry

New plants . . . company news . . . new positions . . . meetings . . . news of societies . . . training courses.

NEW PLANTS

Solvay Process Division, Allied Chemical & Dye Corporation, has entered its seventy-fifth year of chemical manufacturing in 1956 with construction of a new hydrogen peroxide plant at Syracuse, N. Y., completed, and with work on new chlorine-caustic soda facilities at Brunswick, Ga., well under way.

★ ★ ★

Midland Industrial Finishes Company has broken ground for a plant addition in Waukegan, Illinois.

Ground breaking ceremony for new plant addition of the Midland Industrial Finishes Company, Waukegan, Illinois. Left to right are G. E. Batzel, E. O. Robson, and M. A. Glaser.

The addition will be a two story building, providing additional space for manufacturing, warehousing, shipping and receiving. Plans call for 1,000 square feet of the second story to be devoted to the research laboratory.

COMPANIES

The appointment of **F. H. Ross & Company** as distributor in seven southeastern states has been announced by the **Chandeysson Electric Company,** St. Louis. Ross & Co. will handle the Chandeysson line of low-voltage motor generators for plating, tinning and electrolytic work.

Ross & Company has offices throughout the industrial South at: Charlotte, North Carolina; Atlanta, Georgia; Jacksonville, Florida; Birmingham, Alabama; Columbia, South Carolina; Columbus, Georgia; Greensboro, North Carolina; Jackson, Mississippi; Knoxville, Tennessee; Mobile, Alabama; Raleigh, North Carolina; Savannah, Georgia.

★ ★ ★

The Dow Chemical Company has opened a sales office in Buffalo, N. Y., at 70 Niagara St., to serve a substantial part of New York State, extending east to and including Utica. It also will serve a 10-county section of northwest Pennsylvania.

Manager of the office is **Eugene L. Martinez,** who was advanced to the post after nearly 10 years as general chemicals salesman with the company's office in New York City.

The sales staff includes two chemicals salesmen, **Seward H. Mott, Jr.**, and **Gerald L. Mitchell**, and four plastics salesmen, **Ross D. Visger**, plastics supervisor, **Robert F. Bunker, Robert S. Crew** and **Donald W. Ruoff**.

★ ★ ★

An aid-to-education program totaling $462,000 has been approved by the **Pittsburgh Plate Glass Foundation.** The program features financial aid to outstanding high school graduates and direct financial aid to privately endowed colleges and universities.

According to Harry B. Higgins, president of the foundation, these funds will be disbursed during the next four years. He said that expenditures would be $93,000 during 1956, $108,000 for 1957, $123,000 during 1958 and reach $138,000 during 1959.

According to Mr. Higgins, the scholarships will be administered by the National Merit Scholarship Foundation, an independent, non-profit organization whose purpose is to devise and administer a nationwide system of scholarships for higher education.

★ ★ ★

Ramco Equipment Corporation has announced the appointment of the **Baker Distributing Company**, Cleveland, Ohio, as an authorized distributor for Ramco vapor degreasers, power washers and allied finishing equipment.

★ ★ ★

The **Industrial Filter & Pump Mfg. Co.** of Chicago has broken ground to start the construction of a west wing plant expansion. This second expansion represents a growth of 100 per cent in plant area since 1953. As manufacturers of filters, waste treating equipment, ion and heat exchang-

Management of Industrial Filter and contractor participate in ground breaking ceremony. Left to right: Anton Mourek, contractor; A. E. MacQuilkin, comptroller; S. C. Clements, chief engineer; Hans Jensen, vice president in charge of production; J. C. Hesler, manager Waste Treating Department; R. E. Liedberg, executive vice president; R. F. Ledford, director of sales; G. Lundberg, purchasing agent; and C. Lundberg.

ers and pumps, Industrial Filter has served the chemical process, food process and plating industries for over 25 years. Industrial also maintains a rubber compounding and lining division.

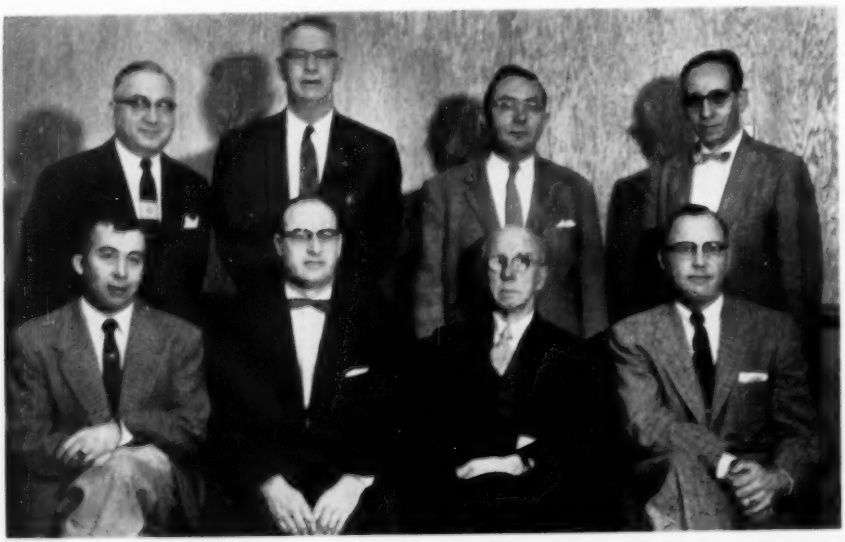
★ ★ ★

The **Neilson Chemical Company,** now celebrating its 25th Anniversary, was founded in March, 1931 by **Raymond H. Neilson.** At that time the total space occupied was less than 2,500 square feet. The principal product originally manufactured by the Neilson Chemical Company was Metalprep, used for the phosphoric acid cleaning and treatment of automobile bodies, refrigerator cabinets, trucks and trailers before painting.

In 1933, the Neilson Chemical Company of Canada started manufacturing operations for supplying Canadian industry direct, under the management of **E. Davenport.** The Neilson Chemical Company of Canada now has salesmen located in Windsor, Toronto and Montreal.

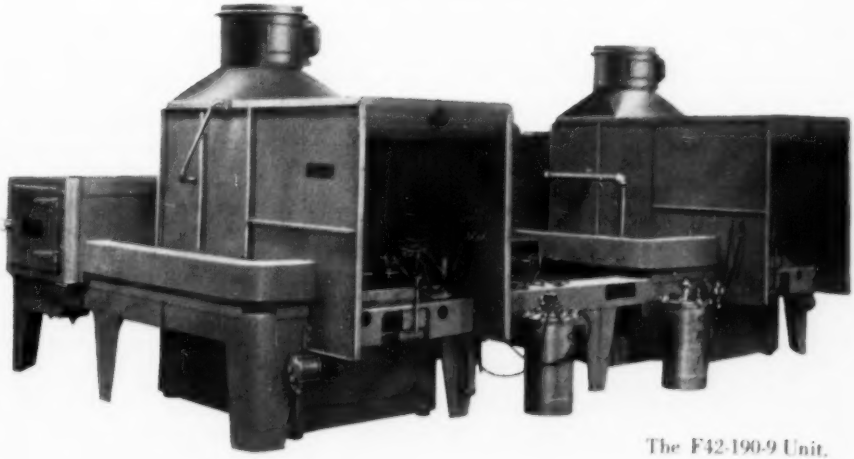
In 1939, operations were further enlarged by the opening of a branch manufacturing plant, again with its own sales organization, in Los Angeles, California.

At present, overall Neilson Chemical Company operations include two plants in Detroit, Michigan; a plant in Windsor, Ontario, Canada; in Los Angeles, California; and a warehouse in Allentown, Pennsylvania. Warehouse facilities are also located in Charlotte, North Carolina; Birmingham, Alabama; and Atlanta, Georgia, under the F. H. Ross Company, with a sales staff for each principal factory and warehouse location. In addition, many of the Neilson Chemical Company Metalprep and other Prep products, are now manufactured abroad, or are otherwise available abroad in Sweden, Switzerland, Portugal, Union of South Africa, New Zealand, Australia, Mexico and other countries.



Neilson Chemical Company officials. Back row (left to right): A. A. DiPaola, sales manager; E. Davenport, Canadian manager; H. Oleson, plant manager; John Leuzinger, technical director. Front row (left to right): D. Johns, comptroller; R. F. Neilson, general manager; R. H. Neilson, founder; H. F. Neilson, director of sales. Company is now in its 25th year.

ANOTHER PAASCHE CONTRIBUTION TO AUTOMATION



The F42-190-9 Unit.

This Automatic Aircoating and Baking Unit is designed to coat and bake camera parts at 10,000 pieces per 8 hour day. A complete finishing system, contains two coating stations, water-wash booths and electrically heated oven.

Bring your production finishing problems to Paasche's Engineers and get the benefit of more than 50 years experience in designing units that will - - -

PACE PRODUCTION -
PRODUCE BETTER FINISHES -
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Write for details and free survey of your finishing problems.

PAASCHE AIRBRUSH COMPANY

Division of Cline Electric Manufacturing Co.

1910 W. Diversey Pkwy. **Chicago 14, Illinois**

In Canada: Paasche Airbrush (Ltd.), Toronto, Ont.

For more data circle 203 on Reader Service Card

The product line was expanded greatly in 1945 from the original complete line of ortho-phosphoric acid metal cleaners and metal treating compounds to an enlarged line. This includes conversion coatings, such as zinc phosphate and iron phosphate coatings for steel, conversion coatings for aluminum, magnesium, galvanized iron and other zinc coated surfaces, along with various processes to handle the needs of any industrial manufacturer, fabricating and finishing articles in size as large as railroad box cars, down to nuts, bolts, and screws. The line of products originally marketed under the trade name of Metalprep still comprises a sizeable portion of the product line.

Other Neilson products include Lyfanite A for aluminum alloys, Lyfanite Z zinc phosphate coatings for ferrous metal surfaces, Phosteem cleaning and phosphate coating products used in conjunction with factory steam or other steam sources, Galvaprep for the treatment of zinc coated surface, Aluminprep for the treatment of aluminum alloys, Solderprep soldering fluxes, Emulsoprep alkaline cleaning products, Prep'Pik'L scale removing products, and Rinseprep final acidulated rinse products.

The product line is being continually expanded as a result of laboratory facilities which have been enlarged and are now under the direction of **J. Leuzinger** in charge of research and new product development, with the customer service laboratory under the direction of **J. Erwin.**

Still active in the company is **Raymond H. Neilson,** the founder; **Raymond F. Neilson,** general operations manager, and **Howard F. Neilson,** director of sales. There are also a number of key personnel who have been with the company for over 20 years, including **E. Davenport,** manager of the Neilson Chemical Company of Canada, **A. A. DiPaola,** sales manager Detroit operations, **Jack Gray,** district representative in Toronto, Canada and **H. Oleson,** general superintendent of Detroit plants.

★ ★ ★

Northwest Chemical Company, 9310 Roselawn Avenue, Detroit 4, Michigan, has completed a major expansion of its Detroit home office and plant facilities, according to an announcement by H. J. McCracken, president and one of the founders of the firm.

The increased space more than doubles the laboratory and research departments, a move necessitated by the company's greatly increased activity in special research for firms seeking custom solutions to metal cleaning problems.

In addition, the warehouse section has been substantially enlarged, and covered loading facilities for all-weather service have been constructed. A completely new second floor affords modern business office accommodations of more than double the old space.

Organized in 1932, Northwest Chemical Co. is today a leading manufac-

Expanded office and plant of Northwest Chemical Co., Detroit.

IT'S NO MYSTERY

. . . WHY MORE AND MORE COMPANIES ARE USING

ELECTRO-GLO ELECTROPOLISHING FOR BETTER METAL FINISHING

Electro-Glo electro-polishing concentrates mean savings to you in Time, Labor and Production Costs. Brightens, smooths and deburrs in one simple operation.

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turer of specialized metal cleaning chemicals. Its products are available nationally through an organization of sales offices and distributors.

★ ★ ★

More than 70 salesmen and executives of the **Osborn Manufacturing Company's Brush Division** have attended a four day national sales conference in Cleveland.

Osborn salesmen from all parts of the United States joined with the company's home office staff to attend these sessions which covered the company's brushing machine program, product development, brush application information, technical developments, and other data.

★ ★ ★

Dr. H. B. Linford, professor of Chemical Engineering at Columbia University and secretary of **The Electrochemical Society** has accepted a check for $10,000 from A. L. Foscue, president of **Electro Metallurgical Company,** to establish the **F. M. Becket Memorial Award.**

Dr. H. B. Linford (left), professor of Chemical Engineering, Columbia University, accepts $10,000 check establishing F. M. Becket Memorial Award from A. L. Foscue, president of Electro Metallurgical Co. Mrs. E. B. Folwell, daughter of Dr. F. M. Becket, witnesses.

Dr. Becket, a pioneer in the production and use of ferro-alloys, for many years headed the research activities of Electro Metallurgical Company, a Division of Union Carbide & Carbon Corp. and a major ferro-alloy producer. The award, in the form of a scholarship, will be available to students who have completed two or more years of study leading to a B.S. degree and are interested in electrothermics.

★ ★ ★

Oakite Rustripper, the alkaline compound that removes rust, oxide scale, paint and shop soils without changing dimensions of precision parts or causing hydrogen embrittlement, will be the "Blue Ribbon" product at Booth 1325 at the American Society of Tool Engineers Industrial Exposition in Chicago's International Amphitheatre, March 19 to 23. It will be displayed by **Oakite Products, Inc.,** manufacturers of industrial cleaning and metal working compounds.

Oakite will also feature Oakite Soluble Oil for machining, grinding, and cutting; Special Drawing Compound and Oakite Composition No. 12 for drawing and forming; and alkaline, solvent, and acidic detergents for production and maintenance cleaning.

F. J. McNally,, manager of Oakite's Chicago division, will be in charge of the booth. He will be assisted by technical service representatives **A. A. Becker, Jack Becker, K. J. Birdwell, E. H. Olson,** and **T. A. Sailor.**

★ ★ ★

The General Ultrasonics Company of Hartford, Connecticut, has announced the appointment of engineering and sales representatives to cover the New England area for the application of ultrasonic processing equipment in the fields of electroplating, cleaning and pickling.

Connecticut will be the responsibility of **The MacDermid Sales and Equipment Corporation** of Bristol, Connecticut.

Massachusetts, Rhode Island, New Hampshire, Vermont and Maine will

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be covered by **Louis V. Gagnon,** who will establish headquarters at Framingham, Massachusetts.

★ ★ ★

A major price reduction on all germanium rectifier models has been announced by **Hanson-Van Winkle-Munning Co.,** Matawan, N. J. Some prices have been reduced as much as 25 per cent depending on voltage and type of voltage control. Price changes became effective on February 1.

A company official has called this price reduction a significant development in the electroplating industry, resulting from improved germanium manufacturing techniques with no reduction in quality. The efficiency and improved voltage regulation of H-VW-M germanium rectifiers is now available to electroplaters and anodizers at reduced cost.

Information on available models and prices of H-VW-M germanium rectifiers may be secured from Hanson-Van Winkle-Munning Co., Church St., Matawan, N. J.

★ ★ ★

Said to be the deepest hard chromium plating tank in the United States, that of the **Superchrome Engineering Co.,** Los Angeles, requires a converted oil derrick to hoist and lower long tubing and rods into position for plating.

Superchrome, established in 1951, specializes in hard chromium applications on rod and tubing for the oil drilling industry.

The deep tank, a recent addition to Superchrome's facilities, is set in a 43 foot pit and extends two feet above ground. It holds 2,350 gallons of chromic acid solution. In the tank it is possible to hard chromium plate the inside diameter of core and oil barrel tubes up to 43 feet in length and with diameters up to six inches.

Full capacity for the tank is 120 core and tube barrels a month.

★ ★ ★

Ideas paid high dividends to six **Carborundum Company** employees, adjudged winners in a recent "TIMI Suggestion Contest" conducted in the United States and Canadian subsidiaries of the company. They are **Michael Hacherl,** a millwright in the Coated Abrasives Division, Niagara Falls, who was named grand prize winner and awarded a 1956 automobile; **Dominic Piazza,** a field service man in the Curtis Machine Company subsidiary at Jamestown, New York, who will receive his choice of furnishings for one room in his home, up to a value of $1200 for his second prize; and **Raymond Fisher,** still operator of separation in the Carbo Metals Division at Akron, New York, who was awarded a stove and refrigerator worth $600.

In addition to these three grand prizes, awards were also made to three company supervisors who placed high in a point system which encouraged contest participation among the employees. A fifteen-day all-expense trip for two to California and the Pacific Northwest was awarded to **Theodore Norwich,** Coated Abrasives Division; a seven-day trip for two to Florida went to **Neil T. Morrison** of the Stupakoff Division, Latrobe, Pa.; and a three-day trip to New York or Washington was awarded **Thomas Johnson** of the Bonded Abrasives Division.

The prizes were awarded by General Clinton F. Robinson, company president, at an informal luncheon held at the Carborundum Guest House in Niagara Falls, and attended by the winners and their wives and a number of company officials.

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Now assembled in one informative new catalog . . . all the latest outstanding developments in ORLON* and DYNEL work clothes! See a tremendous selection of industrial apparel and service uniforms, performance-proved for every need, every purpose, every industry! Discover acid-resistant shirts, pants, coveralls, men's and women's lab coats, that outlast wool and cotton by 50 to 1! Learn about new lint-free, acid-resistant garments for super-clean conditions. Get longer wear with less care . . . savings up to 93%! Send for Worklon's FREE 1956 catalog today! *—DuPont Orlon acrylic fiber

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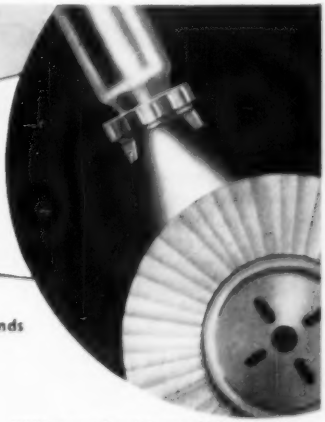
STUTZ

LIQUISPRAY



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Why — **LIQUISPRAY saves you money over bar compounds**
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- No machine downtime to change bars

What — **LIQUISPRAY can mean to you**
- Increased operator efficiency
- More uniform finish and fewer rejects
- Compound costs cut up to 50%
- Tremendous increase in buff life

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WHY you should use LIQUISPRAY
- Abrasives will not settle
- No fire hazard
- No clogging of idle guns
- All the compound sticks to the wheel
- Leaves work free of dirt and easy to clean prior to plating

LIQUISPRAY is the best . . . We invite your inquiry specifying your particular requirements. Samples available.

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Metallurgical Products Co., commercially dormant for the past six years, has resumed production. **I. W. Wilenchik**, president of the company, retired in 1949 on doctor's orders. The six year period of retirement enabled Mr. Wilenchik to devote more time to research, and resulted in the development of lithium copper, a powerful degasser and deoxidizer for high conductivity copper. He also developed a deoxidizer and degasser for aluminum bronze. Metallurgical Products Company produces electrolytic anodes.

★ ★ ★

Mariano Ranno, a partner in the firm of **Imperial Plating Co.**, Brooklyn, New York, has accepted the chairmanship of the metal plating industry's campaign for the 1956 Greater New York $3 million Appeal of the National Foundation for Infantile Paralysis, according to an announcement by Harris A. Dunn, vice-chairman of the board of the Bowery Savings Bank, who is general chairman of the city-wide drive.

NEW POSITIONS

Following the recent death of Allan E. Chester, vice-president and executive head of **Promat Division** of **Poor & Company**, E. C. Bauer, president of Poor & Company has announced the following promotions. **W. F. Stark** has been appointed vice-president to succeed Dr. Chester. **William F. Mooney** has been appointed vice-president in charge of sales.

★ ★ ★

The George L. Nankervis Company of Detroit has announced the opening of a sales office in Flint, Mich.

The Nankervis Company is one of the leading manufacturers of custom-built testing equipment for the automotive and aircraft industries. Typical of the equipment built by Nankervis is a 76 station, fully automatic, V-8 engine test facility recently installed in a Detroit automotive plant for testing engines at the rate of 3,000 a day. Besides its line of testing equipment, Nankervis also designs and builds automation equipment for various operations and in its Commercial Research Division builds flowmeters, and other scientific instruments. In addition to its manufacturing operations, Nankervis also handles a full line of metal finishing equipment and supplies.

The office staff will be under the direction of **Cecil P. Nankervis.**

Cecil P. Nankervis

R. A. Lemersal

E. O. Robson, president of **Midland Industrial Finishes**, Waukegan, Illinois, has announced the promotion of **R. A. Lemersal** to the position of technical sales manager.

Mr. Lemersal joined the company in 1943 as a salesman. He was appointed assistant sales manager in 1953.

★ ★ ★

Bernard Mohr has been appointed technical director of **Ralph V. Rulon, Inc.**, Philadelphia, Pa. Mr. Mohr comes to Rulon from England, where he had been technical manager of H. Windsor & Co., Ltd., London.

★ ★ ★

The Dow Chemical Company has announced expansion of its customer service program for chlorinated solvents and the appointment of **Wallace U. Seiler** as supervisor of solvent field service.

Clean spray booths in a *FLASH* with BOOTHGUARD

SPRAY IT ON—in minutes
STRIP IT OFF—overspray goes with it

Only BOOTHGUARD
WATER-TYPE Coating is . . .

NON-INFLAMMABLE IN STORAGE!
Just as fire safe in its liquid state as it is when dry! No insurance risk — no special storage areas needed.

COVERS COMPLETELY WITH ONLY 1 COAT!
Costs less . . . and you use less. There is no feathering or webbing — less waste. One coat covers entire booth, dries fast and clings tight until you remove it.

STRONGEST COATING MADE!
BOOTHGUARD'S tough, elastic coating will not tear or shred when stripped. Pull it off — all at once.

WHITEST COATING!
BOOTHGUARD gives greater reflection, better visibility — and you use less. You'll have fewer rejects with BOOTHGUARD coating your booths.

See for yourself what BOOTHGUARD and METALGUARD can do for you.

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For more data circle **210** on Reader Service Card

Stanley R. Johns

Stanley Johns has been promoted to district sales manager of the **J. B. Ford Division** St. Louis office of **Wyandotte Chemicals Corporation.**

Before joining Wyandotte Chemicals Detroit sales staff in 1945, Mr. Johns had more than seven years of chemical and production experience. Transferred to the J. B. Ford Division St. Louis office in 1946, Mr. Johns was next attached to an Army Air Force Electro-Chemical Unit at Wright Field and returned to his sales position in St. Louis in 1947.

Mr. Johns will supervise a sales force covering Missouri, Arkansas, western Tennessee and southern Illinois, servicing all industries which use commercial cleaners, germicides, and floor absorbents.

★ ★ ★

James B. Day & Co., manufacturer of lacquers and enamels has announced the appointment of **Carl Gray** as representative for Indiana.

★ ★ ★

George Prziborowski

George C. Prziborowski recently joined the industrial sales staff of **Wyandotte Chemicals Corporation.** He will headquarter in the company's San Francisco district office.

Mr. Prziborowski is thoroughly familiar with the procedures and extensive equipment of both Wyandotte Chemicals Research and Technical Service Departments. He is well trained to provide chemical cleaning and related services to the aircraft, transportation, and petroleum industries.

★ ★ ★

D. R. Glover

Dixie Solvents & Chemicals Company of Louisville, Kentucky has announced that **D. R. Glover** has joined the firm as a sales representative.

Dixie Solvents & Chemicals Company opened a plant in Shively in 1954 and markets industrial chemicals. It is one of seventeen plants operating throughout the midwest and south and is affiliated with the **Solvents & Chemicals Group.**

★ ★ ★

John E. Hawley has been transferred to the Technical Service Department of the **Pennsylvania Salt Manufacturing Company** Chemical Specialties Division.

★ ★ ★

Chester J. Nowak

Chester J. Nowak has been appointed plant superintendent of **Wagner Brothers Equipment Co.,** the manufacturing division of **Wagner Brothers, Inc.,** 400 Midland Ave., Detroit 3, Michigan.

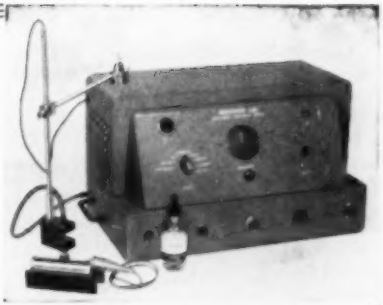
Wagner Brothers, Inc., supplies the metal finishing industry with all types of processing equipment and supplies.

Be sure of your

PLATING

THICKNESS

with the



KOCOUR Electronic Thickness Tester

There's no room for guessing plating thickness when you can have accurate readings quickly. The Kocour Electronic Thickness Tester determines the thickness of chromium, silver, tin, cadmium, zinc, brass, copper, nickel, lead, and other plating. Readings are direct . . . accuracy 90-95%. Write for further information . . . no cost, no obligation.

FREE! Get your reprint of "THICKNESS of ELECTRODEPOSITED COATINGS BY THE ANODIC SOLUTION METHOD" by C. F. Walte.

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4814 S. St. Louis Ave.
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for a SPECK-FREE FINISH EVERY TIME!

SAVE TIME AND WORK WITH BOND TACK CLOTHS — NOW AVAILABLE IN HANDY ROLLS OR CUT BULK—WHITE OR GOLD —IN THREE DIFFERENT TYPES OF CLOTH

Get your Tack Cloth packed just the way it's easiest for you to use . . . either in 150 yard rolls of 36" wide cloth or in handy cartons . . . 100 or more Tack Cloths to the carton.

No matter which way you buy it, you can be sure that every square inch will stay SOFT and TACKY until the very last bit is used up! The Cut Bulk size is 18" x 36" . . . folded to 4½" x 18" for ease of handling. ALL BOND TACK CLOTH is Spontaneous Combustion Proof, Lint-Free, and Wax-Free. Gives a sparkling speck-free Finish every time. Clean and Satisfactory. No waste.

IN ROLLS
Cut off any size piece to use as needed

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Cut and folded. Ready to use.

TRY THEM AND COMPARE RESULTS.
Samples Gladly Sent Upon Request.

Bond® CHEMICAL PRODUCTS CO. 2639 N. CLYBOURN AVE. CHICAGO 14, ILLINOIS

"The Tacky Wiper Specialist"

ALSO INDIVIDUALLY PACKED IN GLASSINE ENVELOPES—144 TO THE CARTON.
A WARRANTY OF SATISFACTION IN EVERY CARTON.

For more data circle 212 on Reader Service Card

Watson-Standard Co., Pittsburgh, Pa., has announced the appointment of **Walter J. Kaufman** as manager, Technical Division.

Mr. Kaufman became associated in 1945 with Watson-Standard, in its manufacturing department.

Mr. Kaufman is a graduate of Grove City College, where he received his Bachelor of Science and Chemical Engineering degrees. He is a member of the American Chemical Society and Pittsburgh Chemists.

John O. J. Shellenberger

Walter J. Kaufman

John O. J. Shellenberger, vice-president, has been appointed director of marketing of the **American Chemical Paint Company,** Ambler, Pa.

In his new capacity, Mr. Shellenberger will supervise sales and marketing activities of the Ambler firm's three main divisions: Metalworking Chemicals, Agricultural Chemicals, and the International Division.

★ ★ ★

Hanson-Van Winkle-Munning Co. has announced the appointment of **James A. Badaluco** to the post of assistant vice president. He continues in his major responsibilities as manager of national buffing compound sales and becomes senior executive at the J. C. Miller Division in Grand Rapids, Mich.

Frederick W. May continues in his present responsibilities as manager of sales, J. C. Miller Division, and in addition becomes the next ranking executive at Grand Rapids.

James A. Badaluco

Frederick W. May

Mr. Badaluco is a past president of the Grand Rapids Branch of the American Electroplaters' Society. He is also a member of the American Society of Metals and of the American Society for Testing Materials.

★ ★ ★

Two personnel changes have just been announced by the **Park Chemical Co.,** Detroit, Michigan.

William P. Askew, who has been in the Specialty Division of the company since 1946, will work out of the home office as sales representative of the Heat Treating Materials Division.

Robert H. Settles has joined the company as sales representative of the Heat Treating Materials Division in the New England states. Prior to coming with the Park Chemical Co. he was with Babcock and Wilcox, Solar Steel Co., and Jos. P. Ryerson.

★ ★ ★

Russell W. Sloan has been advanced to fill the newly created position of manager of commercial development of the **Pennsylvania Salt Manufacturing Company.**

In this position, Mr. Sloan will be responsible for market analysis, market research and market development on new products and on established products new to Pennsalt.

OVENS

for More Uniform—
Faster Drying

- Recirculation Heating
- Electric • Gas • Oil • Steam
- Batch or Conveyor Types
- Safety Control Features
- Save Space and Time
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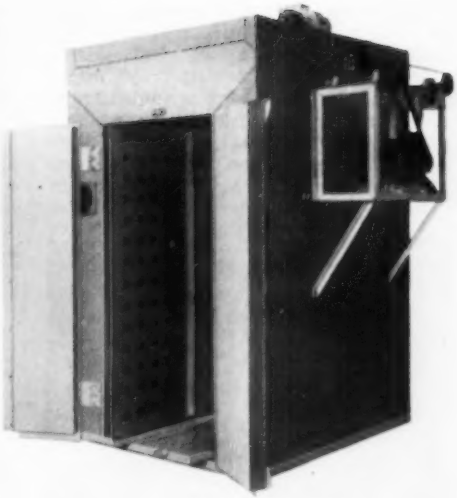

W. S. Rockwell Company • 2906 Eliot St., Fairfield, Conn.

For more data circle **213** on Reader Service Card

Another fine product made finer . . .

with the PARAMOUNT
"Finishing Touch"

"Fine finishes are essential to the sales success of our products," says L. E. Mason Co., leading manufacturer of quality gifts. "To highlight the copper plated and oxidized finish of the coasters, we depend on Paramount Felt Bobs. We get the precise color we want with no 'ragged highlighted ends' and without destroying contrast between the oxidized backgrounds and highlights. Your bobs give good cut, good life while producing the fine finishes we demand."

Wherever fine finishes count, successful firms use Paramount Wheels and Bobs. Join the leaders — specify Paramount. Call your supply house.

Paramount
Felt Wheels,
Bobs, Sheet Felt

Bacon Felt Co.
447 West Water St., Taunton, Mass.

For more data circle **214** on Reader Service Card

Dr. Loren C. Hurd has been appointed president and a director of **Metals Disintegrating Company, Inc.**, Elizabeth, N. J., manufacturer of metal powders, metal pigments, metal abrasives, pulverizing, air conveying and dust collecting equipment. The company is a subsidiary of American Marietta Company, Chicago, Ill.

Guy J. Berghoff

Dr. Loren C. Hurd

Guy J. Berghoff has been appointed general manager of paint sales for the merchandising division of **Pittsburgh Plate Glass Company.**

Prior to his appointment, Mr. Berghoff had served as assistant to the vice president of merchandising.

Clarence M. Brown, chairman of the board of **Pittsburgh Plate Glass Company** since 1931 has announced his retirement. Mr. Brown has been elected honorary chairman and will continue to serve as a member of the board of directors.

Harry B. Higgins, president of Pittsburgh Plate Glass Company since 1944, will succeed Mr. Brown as chairman of the board. **David G. Hill**, vice president in charge of glass manufacturing, has been elected president of the company.

★ ★ ★

Appointment of **Neil W. Vogt** as sales promotion manager for the **Pittsburgh Plate Glass Company, Ditzler Color Division**, in Detroit, Michigan, has been announced by Harold H. Hill, Ditzler general manager. Mr. Vogt succeeds Lloyd R. Vivian who retired after 22 years of service with the Ditzler division.

★ ★ ★

Joseph C. Thompson, Jr., has been appointed general manager of trade sales finishes for the paint and brush division of the **Pittsburgh Plate Glass Company**, a newly created position.

★ ★ ★

Whitfield Chemical Company has announced the appointment of **James E. Dugan** as sales engineer covering parts of Michigan, Ohio, and Indiana.

MEETINGS

The Annual Educational Session and Banquet of the **New York Branch** of the **American Electroplaters' Society** will be held on February 11, 1956 at the Sheraton-Astor Hotel, New York City.

The schedule is as follows:

Educational Session—2:30 P.M. to 5 P.M. at the "South Garden."

Ladies Party (afternoon)—3 P. M., tenth floor.

Banquet—7:30 P.M. in the Belvedere Room.

The Educational Program is as follows:

1. *"New Developments in Leveling Nickel Processes"* — Dr. D. G. Foulke, Hanson-Van Winkle-Munning Co., Matawan, N. J.

A technical discussion will be made of recent developments in leveling nickel, a third major type of nickel.

2. *"A Shop Test for Determining Cleaning Time"*—Dr. H. B. Linford, Columbia University, New York City.

As a result of recent work on A.E.S. Project 12, a new shop test has been developed. This test permits the plater to determine how long it will take his cleaner to remove any particular oil or grease.

SAVE FLOOR-SPACE, TIME, MONEY . . . WITH A PAINT SPRAY BOOTH LIKE THIS

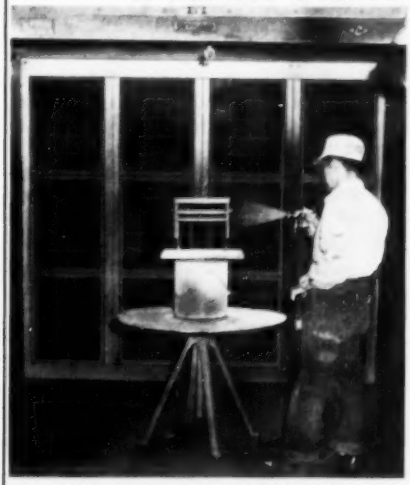

Photo Courtesy Omaha Parlor Frame Co., Omaha, Nebraska

. . . With R P Paint Arrestors

The booth illustrated is just one of the ways to utilize the many advantages of R P Paint Arrestors to increase efficiency . . . and lower costs. These inexpensive pads trap overspray, are easily replaceable with a minimum of down-time and save on maintenance costs and floor-space. R P Paint Arrestors are adaptable to almost every type of operation. Check the R P way to a better, more economical paint spray booth.

RP . . . PRODUCTS OF RESEARCH

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OXIDE COATING for IRON and STEEL

LUSTRE BLACK

is a fast-acting, low-cost method to impart a dense, rust-resisting black oxide finish. Ideal for wrought iron furniture, office equipment parts, camera parts, hardware, tools, ordnance parts and wire specialty products. Excellent bonding properties for paints and enamels. Simple one-bath operation, aqueous solution requires no electric current. Operates at 285-300° F. Samples treated free at Detroit.

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Standard Research, Inc.

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For more data circle **216** on Reader Service Card

A. S. T. M. SYMPOSIUM
Hotel Statler, Buffalo, N. Y., February 29

3. *"Current Trends in Washington on the Nickel Situation"*—H. Hirschman, Dept. of Commerce, Washington, D. C.

Mr. Hirschman, of the Nickel Division of the Dept. of Commerce, will discuss developments in the nickel supply situation. The present picture on uses of nickel will be discussed, followed by discussion of future trends. The role of decorative nickel plating in the event of government controls will be discussed.

Tickets and reservations may be obtained by writing to: Milton Nadel, 41-15 50th Ave., Long Island City, New York.

★ ★ ★

Walter L. Pinner

Committee B-8 of the **American Society for Testing Materials** will sponsor a **Symposium** on "Properties, Tests and Performance of Electrodeposited Metallic Coatings" on February 29th in the Hotel Statler, Buffalo, N. Y.

The program will include the following papers:

1. *"History of ASTM Committee B-8,"* by Dr. William Blum, formerly director of Chemistry Section, U. S. Bureau of Standards.
2. *"Corrosion Behavior and Protective Value of Decorative Copper-Nickel-Chromium and Nickel-Chromium Coatings on Steel,"* by C. H. Sample, International Nickel Company.
3. *"Evaluation of Methods Available for Measurement of Surface Luster in Plated Coatings,"* by Glade Bowman, Standard Steel Spring Division, Rockwell Spring and Axle Company.
4. *"Metal Cleaning Prior to Electroplating,"* by Dr. S. Spring, Pennsylvania Salt Manufacturing Co.
5. *"Comparison of the Corrosion Behavior and Protective Value of Electrodeposited Zinc and Cadmium Coatings on Steel,"* by C. H. Sample and R. B. Teel, International Nickel Company; and A. Mendizza, Bell Telephone Laboratories.
6. *"Evaluation of Supplementary Conversion Coatings on Zinc and Cadmium,"* by Dr. R. E. Harr, Western Electric Company.
7. *"Atmospheric Exposure of Electroplated Lead Coatings on Steel,"* by A. H. DuRose, Harshaw Chemical Company.
8. *"The Standard Salt Spray Test—Is It a Valid Acceptance Test?"* by A. Mendizza, Bell Telephone Laboratories.

Dr. William Blum

C. H. Sample

Engineers, executives, and others concerned with the processing, testing, and use of electrodeposited metal-

A. E. S. ANNUAL TRI-STATE REGIONAL MEETING, Dayton Biltmore Hotel, Dayton, Ohio, March 10.

lic coatings are invited to attend the Symposium. There will be no registration fee.

Walter L. Pinner, Houdaille Industries, Inc., is chairman of the Symposium. **C. H. Sample,** The International Nickel Company, Inc., is chairman of Committee B-8, sponsor of the Symposium.

★ ★ ★

The **Annual Tri-State Regional Meeting, A.E.S.,** will be held on March 10 at the Dayton Biltmore Hotel, Dayton, Ohio.

The Tri-State Region is composed of the membership of the **Cincinnati, Columbus, Dayton, Indianapolis** and **Louisville** Branches.

Clyde Kelly, president of the American Electroplaters' Society, will act as moderator for the Educational Program scheduled for 2:00 P.M. The following papers will be presented:

1. *"Color Anodizing,"* by H. Bengston, Stolle Corp., Sidney, Ohio.
2. *"Plating on Unusual Metals,"* By Dr. Charles L. Faust, Battelle Memorial Institute, Columbus, Ohio.
3. *"Plating for Out-of-Door Exposure,"* by C. F. Nixon, Head of Electrochemistry Department, Research Staff, G.M.C., Detroit, Michigan.

The social program will include a banquet at 6:30 P.M. followed by entertainment and dancing. Banquet tickets are available at $6.50 each. Tickets may be obtained from Jack V. Baker or Julius Teres (Dayton Branch), Ezra A. Blount or Richard K. Evans (Cincinnati Branch), Walter Denney or Douglas Gordon (Columbus Branch), Fritz Anderson or Herbert Kennedy (Indianapolis Branch), and Richard Marshall or James Smith (Louisville Branch).

Robert L. Ruleff, Ruco, Inc., is chairman for this Regional Meeting with **Holle Luechauer,** Moraine Products Division, G.M.C., as co-chairman.

Clyde Kelly

Robert L. Ruleff

★ ★ ★

The Empire State Regional Meeting of the **American Electroplaters' Society** will be held April 14, 1956, at the Statler Hotel in Buffalo, N. Y. Dr. A. A. Janis, president of the Buffalo Branch, A.E.S., has appointed the following committees to manage the Empire State Regional Meeting: Educational Chairman, Frank Rudolph; Finance, James Moneypenny and Charles Fotheringham; Program Chairman, Boris B. Joffe; Publicity Chairman, John Martin; Ladies Program, Mrs. Ruff, Mrs. Hart, Mrs. Martin.

★ ★ ★

Plans for the **43rd Annual Convention** of the **American Electroplaters' Society** are already under way. According to **Arthur G. Pierdon** and **Kenneth M. Huston,** general chairmen of the 1956 conclave in Washington, D. C., principal committee chairmen have been appointed for what should be another outstanding convention. Date of the convention is June 17-21, 1956, with headquarters at the Hotel Statler.

Arthur G. Pierdon

K. M. Huston

Features will include technical sessions with papers by prominent authorities in the fields of electroplating and metal finishing, a keynote speaker, the traditional ladies' program, business sessions of the Supreme Society, a banquet, other interesting events.

Principal committee chairmen are as follows: Educational, Dr. Abner Brenner, National Bureau of Standards; Registration, Fielding Ogburn, National Bureau of Standards; Banquet, Dr. Vernon A. Lamb, National Bureau of Standards; Finance, Jules Horelick, Allied Metal Finishing Co.; Plant Visitations, Vincen J. Hughes, Hughes Chem. Co.; Transportation, T. R. Boggess, Norfolk and Western Railroad; Entertainment, Wendell P. Barrows, Naval Gun Factory; Hotel, Asaf A. Benderly, Diamond Ordnance Fuse Labs; Outing, William Metzger, Jr., National Bureau of Standards; Publicity, Raymond Stricklen, Jr., Allied Research Products, Inc.; Program, Carl H. Thiede, Potomac Electrotype Co.; Ladies' Program, Mrs. A. Pierdon; Dr. William Blum, National Bureau of Standards (retired), is Honorary Chairman, Convention Committee.

TRAINING COURSES

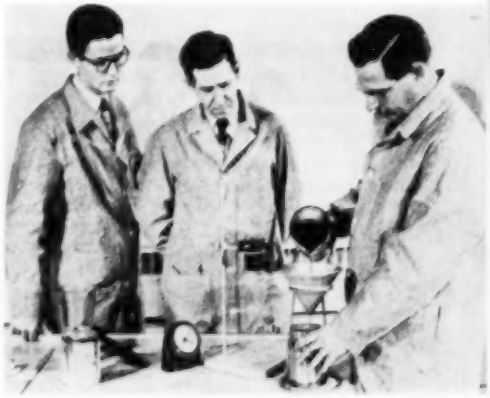
Individualized instruction is the keynote of all courses in the **DeVilbiss Company's School of Spray Finishing Technique**, now starting its thirtieth year of operation at the firm's main plant in Toledo. Close personal contact with instructors is possible because of the restricted enrollment for each class.

Applicants are enrolled for one-week classes of limited size. No charge is made by the company for the week of instruction, the only cost to the students being their transportation and their room and meals.

Topmost on the curriculum of modern methods that are now being covered is a full explanation and operation of the hot spray process of applying materials, a subject of paramount importance to everyone interested in saving time and materials. Paint heating equipment and full facilities for each student to apply finishes by the hot spray method are provided.

The DeVilbiss School, pioneer in the field of spray finishing instruction, attracts students from all parts of the United States and Canada and a score of foreign countries each year. Applications may be obtained by writing the DeVilbiss Company, 300 Phillips Ave., Toledo 1, Ohio.

Here are the dates for forthcoming courses of instruction in industrial spray finishing at the DeVilbiss Company School of Spray Finishing in Toledo: March 5; April 23; May 21; June 11.



Individual instruction is a feature of The DeVilbiss Company's School of Spray Painting.

NECROLOGY

Harold W. Faint

On December 22, 1955, one of the hardest working members of the American Electroplaters' Society suffered a fatal heart attack. **Harold W. Faint,** son of one of the charter members of the A.E.S., Edward W. T. Faint, attended Rutgers University. Though World War I was declared just prior to commencement, he enlisted and served as an officer throughout the war. However, he was given leave to return and graduate with his class in June of 1917. During World War II, he again answered his country's call, serving as a Major stationed in Vienna.

Mr. Faint had a long industrial record, which included work in non-ferrous metallurgy (copper and lead); polishing, buffing and plating and the equipment involved in the metal finishing industry. As an early worker in the use of ion-exchange for waste disposal, he became an authority in that important field. He had already been recognized for his knowledge of filtration. In adapting automatic equipment to production he had few equals.

Frederic B. Stevens, Inc., for whom he was Chicago district manager at the time of his passing, as well as the companies with whom he was associated in the years past, praise his accomplishments.

MEETINGS of INTEREST to FINISHERS

Feb. 10-11. Annual Meeting, Educational Session and Banquet, Southeastern Branch, A.E.S., Biltmore Hotel, Atlanta, Ga.

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Feb. 11. Annual Educational Session and Banquet, New York Branch, A.E.S., Sheraton-Astor Hotel, New York, N. Y.

Feb. 29. Symposium on Properties, Tests and Performance of Electrodeposited Metallic Coatings, Committee B-8, American Society for Testing Materials, Hotel Statler, Buffalo, N. Y.

Mar. 10. Tri-State Regional Meeting, American Electroplaters' Society, Biltmore Hotel, Dayton, Ohio.

Mar. 12-16. Twelfth Annual Conference, National Association of Corrosion Engineers, Hotel Statler, New York, N. Y.

Apr. 7. New England Regional Meeting, A.E.S., Hotel Statler, Hartford, Conn.

Apr. 14. 2nd Annual Empire State Regional Meeting, A.E.S., Hotel Statler, Buffalo, N. Y.

Jun. 17-21. 43rd Annual Convention, American Electroplaters' Society, Hotel Statler, Washington, D. C.

OPPORTUNITY SECTION

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Acme Straight-line Buffing Machine. Four #G-1 heavy duty (15) H.P. Adjustable floating heads and control stand. Through Feed Table 46' x 10" x 33" with variable speed, control box and control panel included. Excellent condition, reasonable price.

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MANUFACTURER'S AGENTS & DISTRIBUTORS WANTED

National Manufacturer of Industrial Chemicals wants further representation in areas in the mid-western states. Line includes spray booth water conditioners and coatings, metal cleaners and phosphatizing compounds, paint strippers, etc. Replies held in strict confidence. Klem Chemicals, Inc., 14403 Lanson Avenue, Dearborn, Michigan.

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As one of the nation's larger manufacturers of industrial cleaning and processing compounds and equipment distributors, we have by far the most complete line of materials for major industry, including ultrasonic equipment and cleaning compounds.

Our technological advance in products and related processes has been so rapid we must expand our sales force, particularly in the Midwest and Eastern manufacturing areas. Industrial Paint Salesmen, Chemical Engineers or men experienced in chemical processing in metal fabrication, plants, will qualify.

Compensation: Base salary, plus commissions based on sales; car allowance or car furnished, reimbursement of expenses; Profit Sharing Plan, a better than average opportunity.

If you qualify, please furnish a complete resume of employment history, age, etc. All replies confidential. Our employees are aware of this ad. Write Box 24, c/o Products Finishing, 431 Main Street, Cincinnati 2, Ohio.

METAL CLEANER SALESMAN

We need experienced, successful technical sales representative with proven sales record for expanding sales program. Must know plating, phosphating, porcelain enameling, other finishing. Liberal draw, commissions, expenses, car, other benefits. Write age, experience, income requirements, territory preference.

COWLES CHEMICAL COMPANY

Metal Cleaner Department

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This Opportunity Section is available for classified advertisements. For advertising rates and other information address:

PRODUCTS FINISHING

431 MAIN STREET, CINCINNATI 2, OHIO

WANTED— CHEMICAL ENGINEER

Fast growing Los Angeles manufacturing plant, employing three to four hundred people.

Exceptional opportunity for man under forty, capable of supervising from fifteen to thirty people in department processing small metal stampings.

Must have experience in high production barrel plating of bright nickel and cadmium. Must be able to experiment and develop new coatings and production techniques. Apply in confidence with complete information, Box No. 21, c/o Products Finishing, 431 Main St., Cincinnati 2, Ohio.

PRODUCT LITERATURE

48. Measuring Viscosity
Information on the Brookfield Viscometer, an electrical device for checking viscosity of paints and other fluids quickly and accurately. Brookfield Engineering Laboratories, 240 Cushing St. Stoughton, Mass.

49. Chemical-Resistant Clothing
Tables give chemical resistance characteristics of fabrics used in work clothes. Worklon, Inc., Dept. PF2, 253 W. 28th St., New York, New York.

50. Heat-Resistant Finish
Details on Sicon heat-resistant finish. Midland Industrial Finishes Co., Waukegan, Ill.

51. Radiant Heat Oven
Advantages of Burdett "Radiant Heat" conveyor type ovens (short baking cycle, uniform bake, close control) are discussed. Burdett Manufacturing Co., 3447 W. Madison St., Chicago 24, Ill.

52. Polishing Wheel
Folder describes and illustrates Kon-Toor Wheel, designed for polishing complex contours. Behr-Manning Div., Norton Co., Troy, N. Y.

53. Black Oxide Finish
Bulletin H-16 describes a rust resistant decorative black oxide finish applied by the Park 290 Process. Park Chemical Co., 8078 Military Ave., Detroit 4, Mich.

54. Aluminum Processing Chemicals
Emulsion cleaners, inhibited alkaline cleaners, deoxidizing cleaners, an aluminum etchant and desmutting agents are among the chemicals discussed in this catalog of aluminum processing chemicals. Pennsylvania Salt Mfg. Co., 3 Penn Center Plaza, Philadelphia 2, Pa.

55. Finishing Ovens
Literature shows advantageous features of Lanly baking ovens. The Lanly Co., 760 Prospect Ave., Cleveland, Ohio.

56. D. C. Generators
Advantages of Chandeysson Motor Generators are detailed. Chandeysson Electric Co., 4082 Bingham Ave., St. Louis 16, Missouri.

57. Silk Screen Inks
Information on the 5500 Series of Fast Dry Process Ink and other paints, varnishes and lacquers. Naz-Dar Co., 461 Milwaukee Ave., Chicago 10, Ill.

58. Alkali Cleaning Units
Full information on the use of Stutz alkali cleaning and rinsing machinery is given. George A. Stutz Mfg. Co., 4410 Carroll Ave., Chicago 24, Ill.

59. Polishing Machine
Information on the Micro-Polish method of polishing. Advantages include improved product uniformity and elimination of dust. Murray-Way Corp., P.O. Box 180, Maple Rd. East, Birmingham, Mich.

60. Pre-cut Masks
Information on Brady Pre-cut Masks. These masks are cut to special shapes and are adhesive backed, so that they may be used for masking apertures and in other selective masking operations. W. H. Brady Co., 746 W. Glendale Ave., Milwaukee 12, Wis.

61. Complete Finishing System
Brochure No. 12F-J7 discusses advantages to be gained through installing an integrated complete organic finishing system. George Koch Sons, Inc., Evansville, Indiana.

62. Vacuum Coating
Details of methods and equipment used for vacuum coating are given in "Rapid Cycle" Vacuum Coater Bulletin. Naresco Equipment Corp., Dept. 231, Charlemont St., Newton Highlands 61, Mass.

63. Build Your Own Oven
Possibilities of building an oven from infra-red interlocking oven sections are illustrated. Dri Quik Div., Dry Clime Lamp Corp., Greensburg, Ind.

64. Recorder-Controllers
Bulletin F-452M, which may be obtained from the Fielden Instrument Division of the Robertshaw-Fulton Controls Co., 2920 N. Fourth St., Philadelphia 33, Pa., describes and illustrates Fielden Multipoint Recorder-Controllers. These circular chart recorders can be used to record and control temperatures at up to 96 points on a single chart.

65. Rust-Inhibiting Metal Cleaner
Various features of Expray-AP, a new alkaline spray cleaner for removing fabricating soils and preventing rust prior to finishing. Wyandotte Chemicals Corp., J. B. Ford Div., Wyandotte, Mich.

66. Compound Applicator
Description of air-operated "Auto Doper" used to apply a controlled even coating of buffing compound automatically while buffing wheel is in operation. Hammond Machinery Builders, Inc., 1622 Douglas Ave., Kalamazoo, Mich.

67. Platecoils
Advantages of embossed tube design heat exchanger for process heating and cooling are discussed in Bulletin P50. Platecoil Div., Tranter Mfg. Inc., Lansing 4, Michigan.

For Free Literature Circle Numbers on Card Inside Front Cover

For Free Literature Circle Numbers on Card Inside Front Cover

68. Airpainting Equipment
Catalog illustrates a complete line of spraying equipment and accessories including guns, pressure tanks, stripers, booths, automatic buffing units, and units for removing foreign matter from compressed air. Paasche Airbrush Co., 1910 Diversey Parkway, Chicago 14, Ill.

69. Degreasing Data
Specifications and design features of a complete line of vapor degreasers designed for laboratory and production vapor degreasing. Mechanical Process Co., Inc., 392 Valley St., South Orange, N. J.

70. Germanium Rectifiers
Folder contains technical details and advantages of germanium rectifiers in producing d.c. power. Section 463-12E, General Electric Co., Schenectady 5, N. Y.

71. Quartz Ovens
Advantages of quartz heating elements in baking paint. Cleveland Process Co., 1965 E. 57th St., Cleveland 3, Ohio.

72. Brass Plating Solutions
Brass plating solutions available in a variety of colors; can be formulated to give various effects. True Brite Chemical Products Co., Box 31, Oakville, Conn.

73. Mist Inhibitor
Solution and special dispenser are effective in controlling chromic acid mist. Wagner Bros., Inc., 400 Midland Ave., Detroit 3, Mich.

74. Backstand Idlers
Specifications and advantages of various types of backstand idlers. Matheu Tool Works, 2426A N. Clybourn, Chicago 14, Illinois.

75. Electrostatic Finishing Systems
Case history file shows typical applications in which the electrostatic spray method has helped to spray finish more efficiently. Ashdee Electrostatic Products, Inc., 18032 Dixie Hghy., Homewood, Illinois.

76. "They Are Here"
Booklet gives answers to 20 difficult finishing problems. Enthone, Inc., Dept. PF, 442 Elm St., New Haven 11, Conn.

77. Tumble Finishing Equipment
Catalog shows complete line of tumbling equipment, accessories and supplies. Grav-I-Flo Corp., Dept. PF-1, Sturgis, Michigan.

78. Zinc Phosphate Coating
Folder shows test results which demonstrate adherence of Metabond zinc phosphating compound. International Rustproof Corp., 12507 Plover Ave., Cleveland 7, Ohio.

79. Vapor Degreasing Facts
Booklet gives advantages and typical applications of the vapor degreasing process. Non-flammable solvents are discussed. E. I. du Pont de Nemours & Co., Inc., Electrochemicals Dept., Wilmington 98, Delaware.

80. Plating Rectifiers
Bulletin 5500 contains data on better arrangement of rectifiers and valuable installation hints. Ther Electric & Machine Wks., 13A S. Jefferson St., Chicago 6, Ill.

81. Portable Plating Barrel
Literature gives details on a portable plating barrel. George A. Stutz Mfg. Co., 4410 Carroll Ave., Chicago 24, Ill.

82. Hardness Conversion Tables
Celluloid card gives approximate relationship between Brinell, DPH (Vickers), Rockwell and Shore Scleroscope hardness values and corresponding tensile strengths of steels. Data from SAE Handbook. International Nickel Co., Inc., 67 Wall St., New York 5, N. Y.

83. Electroplating Data Chart
Chart designed to provide comparative data on gold, rhodium, palladium, platinum, silver and nickel. Technic, Inc., 39 Snow St., Providence 1, R. I.

84. Polishing, Buffing Compounds
Formax Mfg. Corp., Detroit 7, Mich., has available Catalog No. 61, listing many compounds used for polishing, buffing, and burring. Under each listing is a discussion of specific applications for the material. Polishing wheel cements are also included in the discussion.

85. Pressure Sensitive Tape Manual
A few of the ways in which pressure-sensitive tapes serve the finishing industry are described. The manual contains 311 illustrations showing how 47 of the more than 300 available "Scotch" brand pressure-sensitive tapes can be used. Minnesota Mining and Manufacturing Co., Dept. P-537, St. Paul, Minn.

86. Metal Cleaning Equipment
The basic line of Circo degreasers for metal cleaning is presented in Bulletin 521. Standard and special apparatus for handling practically every type of grease or dirt removal problem in either manual or conveyor operated systems are outlined and illustrated. Circo Equipment Co., 128 Central Ave., Clark (Rahway), New Jersey.

87. Cutting Barrels
Specification sheet on Hartford Triple Action Enclosed Cutting Barrels. Features gear shift speed control, drum type reversing switch, magnetic starter and brake. Fully variable speed is optional. Hartford Steel Ball Co., Inc., 14 Jefferson Ave., W. Hartford 6, Conn.

88. Plating and Anodizing Racks
New features of racks designed for plating and anodizing are described. National Rack Co., Inc., 179-181 Madison St., Paterson, N. J.

89. Filters
Six catalog sheets on the complete line of Sel-Rex Double Duty filters for liquid clarification or solids recovery. Bart-Messing Corporation, Department PF, 229 Main St., Belleville, N. J.

90. Anodized Aluminum Tester
Catalog No. 12 features an Anodized Aluminum Tester. A complete description of the tester, together with information on operation, special features, and specifications are presented. Sunshine Scientific Instrument, 1810 Grant Ave., Philadelphia 15, Pa.

91. Small Parts Handling Equipment
Catalog DN-1000, covering all products in the NesTier line of small parts handling equipment. Booklet illustrates, describes and gives specifications for the various types of NesTier nesting-stacking boxes and baskets. The Chas. Wm. Doepke Mfg. Co., Inc., 8898 Blue Ash Rd., Rossmoyne, Ohio.

92. Polishers
Catalog 72PX shows a variety of buffing and polishing machines, gives specifications for each. The Hisey-Wolf Machine Co., Cincinnati 8, Ohio.

93. Metal Cleaning Equipment
Data sheets on several types of vapor degreasers and mechanical washing machines. Batch type, tumbling, "Rotomatic," portable, and conveyorized types of degreasers are described. Phillips Manufacturing Co., 3457 W. Touhy Ave., Chicago 45, Ill.

94. Fume Separators
Folder illustrates and describes how Niehaus Fume Separator eliminates air pollution and cuts heating costs in plants where elimination of objectionable fumes is a problem. Industrial Electroplating Co., Inc., 2325 Valley Ave., Indianapolis 18, Indiana.

95. Mechanical Container Shaker
Data sheet shows several models of machines designed to mix paint thoroughly without opening the container. Miracle Paint Rejuvenator Co., 127 E. 9th St., St. Paul 1, Minn.

96. Rustripper
Folder entitled "Here's the Best Shortcut in the Field of Electroplating," describes material formulated to remove rust, oil, oxides, drawing compounds, and to strip zinc and cadmium from racks and rejects. Oakite Products, Inc., 20 Rector St., New York 6, N. Y.

97. Zinc Plating Brightener
Detailed information on Ziniux, a brightener for still and barrel zinc plating, is available in a technical data sheet being distributed by Kosmos Electro-Finishing Research, Inc., 13 Valley St., Belleville 9, New Jersey.

98. Blackening Compounds
Technical bulletins discuss blackening compounds formulated for specific applications. Swift Industrial Chemical Co., Albany Turnpike, Box 301, Canton, Conn.

99. Baking Ovens
Specifications and application data on a complete line of baking ovens: large, small, conveyorized, batch, truck. Kirk & Blum Mfg. Co., 3116 Forrer St., Cincinnati 9, Ohio.

100. Buffing Compound
Complete details on Liquimatic buffing compound and an electrically operated system which automatically dispenses this material to the buff in the quantity desired. Hanson-Van Winkle-Munning Co., Matawan, N. J.

101. Airless Spray Painting
Data on airless spray painting system and advantages thereof. Bede Products Corp., Jackson St., Amherst, Ohio.

102. Metal Cleaning Solvent
Booklet contains valuable suggestions on the use and handling of Niaik Trichlorethylene degreasing solvent. Niagara Alkali Div., Hooker Electrochemical Co., 60 E. 42nd St., New York 17, N. Y.

103. Parts Handling
Bulletin contains information on standard and custom-engineered baskets for small parts handling. Wire and Iron Products Co., 1719 Sixteenth St., Detroit 16, Michigan.

104. Plating Power
"Guide to Better Plating Power" is title of 12-page booklet showing line of Sel-Rex selenium rectifiers. Bart-Messing Corp., Sel-Rex Rectifier Div., Dept. PF, 229 Main St., Belleville 9, N. J.

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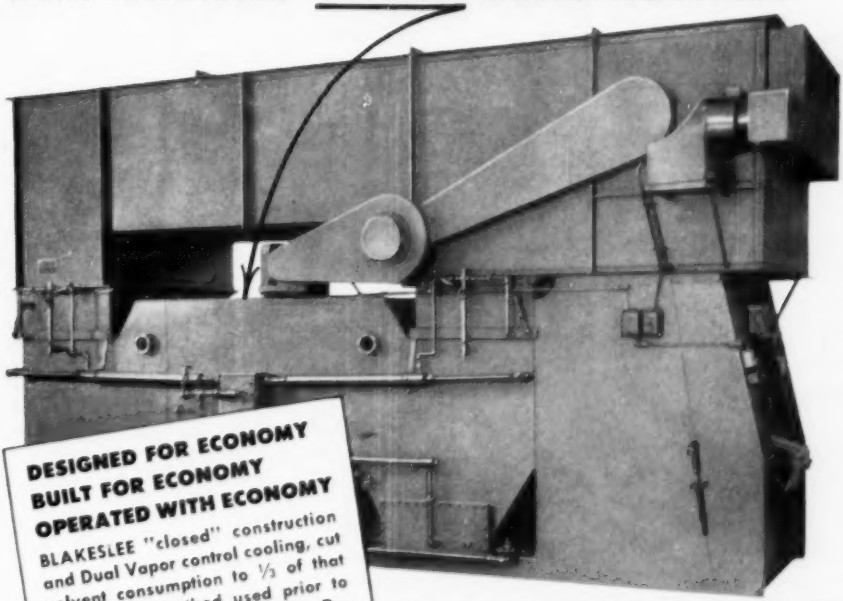

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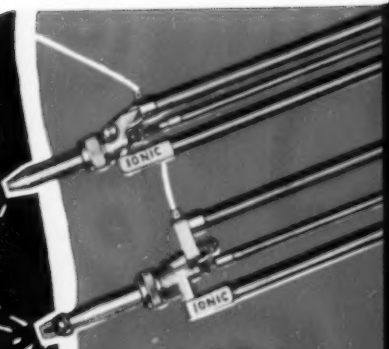

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